

# Food security for sustainable agriculture development: A perception of women empowerment in Rajasthan, India

Aishwarya Dudi and M.L. Meena

Women play a vital role in advancing agricultural development, food security and nutritional outcomes. They participate in all aspects of rural life, including paid employment, trade and marketing, as well as raising crops and animals, collecting water and wood for fuel and caring for family members. But women face multiple constraints in many of the activities they pursue that limit their productivity. Relative to men, women tend to own less land, have limited ability to hire labour and have impeded access to credit, extension and other training services. They started to work in almost all fields like men and are equal to men. In spite of the various measures taken up by the government after independence women haven't been fully empowered. The ground reality is deprivation and exploitation of women specially women from rural areas and those belonging to deprived sectors of the society. The study was conducted in Pali district. For this study, 160 rural women were selected and gathered information through structured interview schedule. The results of the study revealed that, majority of the women participated regularly in activities like sowing operations, weeding and intercultural operations, harvesting and post harvesting operations and animal husbandry activities. Major per cent of them participated in training demonstrations on vermiculture training and dairy training. Majority of the women perceived that losses at storage (due to storage pests attack), pests and diseases attack are the major causes for food grain losses. Empowerment of women in agriculture field is one of the major strategies for achieving food security. Hence, there is a need for empowerment of women in terms of social, cultural, economical and educational dimensions to play an important role in the overall development of the country. There is a need for empowerment of farm women to take care of food production and post harvest production losses for global food security through extension strategies.

**Key Words :** Adoption, Knowledge, Empowerment, Food security, Sustainable, Vermiculture

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## INTRODUCTION

There is a strong relationship between gender-based discrimination and the different channels through which

households and individuals access food - through own-production, access to waged employment, or social protection. The report shows that while equality of treatment between women and men and food security are mutually supportive, gender equality remains an elusive goal in many parts of Asia and the Pacific. A transformation of traditional gender roles is urgently needed. Such a transformation should build on improved information about the range of inequalities and specific constraints facing women. In addition, in order for gender equality strategies and food security strategies to

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complement each other and for their synergies to be maximized, a combination should be found between the recognition of the constraints women face, the adoption of measures that help relieve women of their burdens, and the redistribution of gender roles in the discharging of family responsibilities. The report explores how this combination can be achieved, identifying the best practices that have emerged both in the Asian and Pacific region and in other parts of the world.

Out of the three basic needs of mankind, food is the first and most important one. With population growth rate of 1.50 per cent in the world, it is the most important concern of providing food to the population. This inevitable population growth will place increasing demands on the production of food grains, which currently comprise 67-80 per cent of human food supply and diet. Grain losses were due to poor storage accounts 10 to 20 per cent of overall production. Properly storage of grains is equally important to grain produced. India produces about 259.32 million tons of food grains annually (FAO, 2016). Food grains undergo a series of operations such as harvesting, threshing, winnowing, bagging, transportation, storage and processing before they reach to the consumer. There are remarkable losses in crop output at all these stages. The food grain losses in India from 2005- 2016 are 1, 94,502 metric tons (FCI, 2016).

Women in India are the backbone of the society and important resource in agriculture and rural economy. They make essential contributions to the agricultural development and allied and household activities and pursue multiple livelihood strategies. These activities include producing agricultural crop, cleaning animals, preparing food, working in rural enterprises, engaging in trade and marketing, caring family members and maintaining their homes. About 65.7 per cent of all economically active men are engaged in agriculture as compared to 77 per cent of women. Traditionally, women have always played an important role in agriculture as farmers, co-farmers, wage labours and managers of farms. They have conventionally been producers of food from seed to kitchen. They carry the heavier work burden in food production and because of gender discrimination, get lower returns for their work. The multiple role of women leads to a significant contribution in real terms to the productive system. But it is unfortunate that her role is not adequately recognized and properly her contribution not qualified in the male- dominated society. They have

been underrepresented in the development process.

Now the world has been changed, so the women have changed. They have started to work in almost all fields like men and equal to men. In spite of the various measures taken up by the government after independence women haven't been fully empowered. The ground reality is deprivation and exploitation of women specially women from rural areas and those belonging to deprived sectors of the society. Globalization has offered tremendous opportunities for overall growth and development of both men and women. It has altered the socio-economic status, life style and life condition of women. Globalization has given women a stronger voice. People are more accepting of women's rights. There has been an increased emphasis on women's rights at the grass roots level. Women started to participate in social activities and their economic conditions have also improved. Even there, women at village level are not getting the benefits of the developmental programmes. Women are generally responsible for selection and preparation of food in any family. Women influence the farmer in many ways. She influences the farmer in selection of crop, developing the farm with irrigation and other facilities, adoption of latest technologies, timely harvesting, assisting the farmer in post harvesting and storage, timely marketing of the produce and in savings for the future. In spite of all these, women are not given proper attention. But the globalization has provided many ways and means for the overall development and empowerment of women. For sustainable food security and development women empowerment is crucial in the present situation.

Agricultural products may be lost in the pre-harvest, harvest, and post-harvest stages. Pre-harvest losses occur before the process of harvesting begins and may be due to insects, weeds, and rusts. Harvest losses occur between the beginning and completion of harvesting and are primarily caused by losses due to shattering. Post-harvest losses occur between harvest and the moment of human consumption. They include on-farm losses, such as when grain is threshed, winnowed and dried, as well as losses along the chain during transportation, storage, and processing. There is a scope to prevent the loss at the farm level by empowering the farm women in carrying out these operations as majority of the operations were carried out by women only. With this background the present study was undertaken with the objectives of knowing the socio-economic characteristics of farm women, extent of

participation in agricultural activities and the perception regarding the causes for food grain losses.

## METHODOLOGY

The research study on farm women was conducted in Pali district of Rajasthan. Pali district was purposively selected based on the farm women exposed to training and demonstration programmes conducted by Krishi Vigyan Kendra CAZRI, Pali. In Pali district, Sojat and Rohat blocks were selected. From each block four villages were selected. Twenty respondents were identified from each village by following simple random sampling technique. Thus, the total sample size for the study was 160 farm women. Ex-post-facto research design was employed in the present investigation. The data were collected personally from the respondents using a pre-tested structured interview schedule. The gathered information was analyzed by using appropriate statistical methods.

## OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

### Profile characteristics of respondents:

It is clear from the Table 1 that, majority (66.25%) of the respondents belonged to middle aged category followed by young (29.38 %) and old (04.38 %) age categories. With respect to upto primary and middle school, majority (36.88%) of them was educated followed by upto senior secondary school 30.64 per cent of respondents educated and 25.62 per cent of them were illiterates and smaller per cent of them were educated to graduation (06.88%). It is evident from the table that, slightly more than half (55.63 %) of them belonged to small family size followed by medium (33.13%) and large (11.24%) family size, respectively. With regard to land holding, majority (49.38%) of the respondents belonged to marginal farmers' category with a land holding of less than 2 acres 44.38 per cent of them were small farmers with a land holding of 2 to 5 acres. Only 06.25 per cent of them were big farmers with a land holding of more than 5 acres. In case of extension participation, majority (56.88%) of the respondents belonged to medium extension participation category followed by low (34.38%) and high (08.75%) categories, respectively. With regard

**Table 1 : Profile characteristics of respondents (n=160)**

Particular	No.	Per cent (%)
<b>Age</b>		
Young (upto 28 years)	47	29.38
Middle (29 to 50 years )	106	66.25
Old (above 50 years)	07	04.38
<b>Educational qualification</b>		
Illiterate	41	25.62
Primary and middle school	59	36.88
Upto senior secondary school	49	30.64
Graduation	11	06.88
<b>Family size</b>		
Small (upto 6 member)	89	55.63
Medium (7 to 10 member)	53	33.13
Large (10 members and above)	18	11.24
<b>Land holding</b>		
Marginal farmers (upto 2 acres )	79	49.38
Small farmers (2 to 5 acres)	71	44.38
Big farmers (more than 5 acres)	10	06.25
<b>Extension participation</b>		
Low (upto 2)	55	34.38
Medium (3 to 5)	91	56.88
High (6 and above)	14	08.75
<b>Mass media utilization</b>		
Low (upto 2)	47	29.38
Medium (3 to 6)	86	53.75
High (6 and above)	27	16.88
<b>Risk orientation</b>		
Low ( upto 14)	49	30.63
Medium (15 to 24)	72	45.00
High (25 and above)	39	24.38
<b>Scientific orientation</b>		
Low (upto 18)	36	22.50
Medium (19 to 23)	93	58.13
High (24 and above)	31	19.38

to mass media utilization, majority (53.75%) of them belonged to medium category followed by low (29.38%) and high (16.88%) mass media utilization categories, respectively.

It is also clear from Table 2 that, 45.00 per cent of the respondents were in medium risk orientation category followed by low (30.63%) and high (24.38%) risk orientation categories, respectively. Slightly more than fifty (58.13%) per cent of the respondents belonged to medium

scientific orientation category and 22.50 and 19.38 per cent of them were in low and high scientific orientation categories, respectively.

### Participation of respondents in agriculture and allied activities:

Women participate in various agricultural activities. The level of participation of women in agricultural and allied activities varies greatly depending on the nature of the activity and also skill required for the activity. In most of the cases, women carry out the operations requiring great skills like sowing, grading, cleaning etc. It is evident from the Table 2 that, as high as 80.00, 76.25, 71.25 and 69.38 per cent of the women respondents participate regularly in harvesting and post harvesting operations, sowing operations, animal husbandry activities and weeding and inter cultivation operations, respectively. Other agricultural operations in which the women participate regularly are land preparation (23.13%), selection of crop and variety (18.13%) and irrigating the crop (16.88%), plant protection activities (14.38%)

manuring (10.63%) and transportation and marketing (6.88%). It might be due to the fact that, these are the operations that require great skill and expertise and also these are the crucial operations in agricultural production. Chayal and Dhaka (2010) also reported that majority of farm women participate in harvest and post harvest operations and other operations like sowing, manure application and irrigation were performed on field by women.

It is also evident from the Table 2 that, the farm women participate occasionally in operations like land preparation (35.00%), selection of crop and variety (30.63%), irrigating the crop (24.38%) and weeding and inter cultivation operations (22.50%). Other activities in which women participate occasionally are plant protection (19.38%), animal husbandry activities (19.38%), manuring (18.13%), sowing operation (16.88%), transportation and marketing (13.12%) and harvest and post harvesting operations (10.63%). It might be due to lack of strength and ability of farm women to carry out ploughing and other land preparation activities including inter cultivation

Activity	Regularly		Occasionally		Never	
	No.	%	No.	%	No.	%
Land preparation	37	23.13	56	35.00	67	41.87
Selection of crop and variety	29	18.13	49	30.63	82	51.24
Sowing operation	122	76.25	27	16.88	11	06.87
Weeding and inter cultivation operation	111	69.38	36	22.50	13	08.12
Irrigating the crop	27	16.88	39	24.38	94	58.74
Manuring	17	10.63	29	18.13	114	71.25
Plant protection activities	23	14.38	31	19.38	106	66.24
Harvesting and post harvesting operations	128	80.00	17	10.63	15	09.37
Transportation and marketing	11	06.88	21	13.12	128	80.00
Animal husbandry activities	114	71.25	31	19.38	15	09.37

Training/ demonstrations	No.	Per cent (%)
Vermiculture	135	84.38
Use of agri. waste as organic matter	123	76.88
Production of organic manure	104	65.00
Dairy	117	73.13
Fodder production technologies	78	48.75
Clean milk production technologies	98	61.25
Preparation of milk products	113	70.63

operations. Similar results were also reported by Chayal *et al.* (2013). It is also clear from Table 2 that, transportation and marketing (80.00%), manuring (71.25%), plant protection activities (66.24%), irrigating the crop (58.74%), selection of crop and variety (51.24%), land preparation (41.87%) are the some of the agricultural operations in which farm women never participate. Other activities in which women participate never are harvesting and post operations (9.37%), animal husbandry activities (9.37%), weeding and inter cultivation operation (8.12%) and sowing operation (6.87%). The findings confirm with the findings of Meti and Sathiash (2014).

### Participation of farm women in capacity building programmes (training):

It is clear from the results of Table 3 that, out of seven training programmes majority (84.38 %) of farm women actively participated in trainings on vermiculture, use of agricultural waste as organic matter (76.88%), dairy training (73.13%), preparation of milk by-products (70.63%), production of organic manure (65.00%), clean milk production technologies (61.25%) and fodder production technologies (48.75%). This is because of importance and ease of practical adoptability by the farm women. The findings indicate the fact that majority of the farm women have realized the importance of participation in trainings resulting in higher aspiration for economic returns, higher achievement motivation for improved standard of living provoked by the organization during training on agro based entrepreneurship.

### Impact of vermicompost and dairy training on knowledge status of farm women:

Table 4 presents information about knowledge level of respondents on vermicompost and dairy and their mean per cent score. The knowledge in vermicompost and dairy found high with overall mean per cent score 76.3 and 73.8, respectively.

In aspect of vermicompost majority of the respondents (70%) were in category of medium knowledge with mean per cent score of 79.7 while 17.50 per cent respondents were in category of high knowledge with mean per cent score 97.2 and 12.50 per cent respondents were in category of low knowledge with mean per cent score 57.3 in aspect of dairy majority of the respondents (75%) were in the category of medium knowledge with mean per cent score of 73.7 and 16.25 per cent respondents were in category of high knowledge with mean per cent score of 87.5, while only 8.75 per cent respondents were in category of low knowledge with mean per cent score of 55.4. It might be due to their interest and active participation in trainings and demonstrations. The interest and active participation of individuals in training and demonstrations improves the knowledge status. Findings confirm with the findings of Meti and Sathish (2014).

### Perceived causes of food grain losses:

It is clear from the Table 5 that, losses at storage (pests attack) is the major cause for the loss of food grains as expressed by majority (89.37%) of the farm

Aspect	Distribution of responses (%)			Mean per cent score			Overall mean per cent score
	High	Medium	Low	High	Medium	Low	
Vermicompost	17.50	70.00	12.50	97.2	79.7	57.3	76.3
Dairy	16.25	75.00	08.75	87.5	73.7	55.4	73.8

Causes	No.	Per cent (%)
<b>During production</b>		
Use low quantity inputs	71	44.37
Weeds infestation	58	36.25
Insects and pests attacks	133	83.13
Disease attacks	123	76.87
<b>During harvesting and post harvesting</b>		
Poor handling during harvesting and post harvesting operations	77	48.13
Losses at storage (pest attack)	143	89.37

women. Insect pest attack during crop production stage was also one of the major causes of food grain loss as expressed by 83.13 per cent of the respondents. Other reasons for food grain losses as perceived by farm women are diseases attack (76.87%), poor handling during harvesting and post harvesting operations (48.13%), use of low quality inputs (44.37%) and weeds infestation (36.25%). This might be due to the fact that farmers generally store the food grains in traditional storage structures without following any scientific methods and also they don't take up any scientific control measures against storage pests. Findings confirm with the findings of Meti and Sathish (2014) and Sahu *et al.* (2015).

### Relationship between profile characteristics of respondents with their participation in agriculture and other allied activities:

It is clear from Table 6 that, the variables like land holding, extension participation, risk orientation and scientific orientation exhibited positive and significant relationship with the extent of participation of respondents in agricultural and allied activities. Whereas, variable family size showed negative and significant relationship with the extent of participation of respondents in agricultural and allied activities. Other variables like age, educational qualification and mass media utilization did not show any relationship with the extent of participation of the respondents in agricultural and allied activities. Hence, there is a need for empowerment of farm women through extension education activities for effective and efficient participation in agricultural activities. Hence, there is a link between women empowerment and food security measures, therefore, the policy makers and administrators should give importance to women empowerment with

Variables	(r)
Age	-0.039
Educational qualification	0.065NS
Family size	-0.421*
Land holding	0.632*
Extension participation	0.348*
Mass media utilization	0.043NS
Risk orientation	0.678*
Scientific orientation	0.623*

\* indicate significance of value at P=0.05, NS = Non-significant

respect to food security measures through intensive training and demonstration (Aggarwal *et al.*, 2013 and Basavaraja *et al.*, 2007 ).

### Conclusion:

It may be concluded that the rural women constitute the most important work force in Indian economy and majority of the agricultural operations were carried out by the farm women. It is concluded from the study that, harvesting and post harvesting operations, sowing operations, weeding and inter cultivation operations and animal husbandry activities are the operations in which farm women participate regularly. Participation of farm women incapacity building programmes like demonstration, trainings, field visits, etc. enhances the knowledge level which in turn improves the income level and their standard of living. This in turn empowers them in achieving food security of the family. Transportation and marketing, manuring, plant protection activities, irrigating the crop, selection of crop and variety, land preparation are the operations in which farm women never participate. Development of entrepreneurship among farm women through appropriate extension strategies like group discussion, demonstration, training and exposure visit is crucial for sustainable development of farm women. Further, the participation of women in all the agro based enterprise through convergence of all stakeholders and facilitators is required. Hence government has to make a policy for all-round development of women.

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