Assessing the Knowledge Gap of Women Vegetable Growers in Bihar

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Authors' contributions

This work was carried out in collaboration among all authors. Author SR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SK managed the analyses of the study. Authors RKS and AP helped in questionnaire preparation. All authors read approved the final manuscript.

Original Research Article

ABSTRACT

Women take part in almost all the activities related to vegetable production as well as marketing such as purchasing of seeds, sowing of seeds, transplanting, weeding, harvesting and post-harvest operations but due to lack of knowledge, they are straggling behind than the existing international standards of vegetable production. Therefore, the present study was undertaken in Bhagalpur district of Bihar (India) to assess the knowledge gap of 120 women vegetable growers through structured schedule. Findings of the study revealed that knowledge gap was very low in case of recommended practices such as land preparation (58.67%), disease management (58.34%), sowing time of the crops (60.00%), harvesting of vegetable crops (60.00%), weed management (61.67%), seed rate (68.34%) and very high in case of agronomical practices (83.33%), irrigation management (75.00%), fertilizer management (71.67%) and insect pest management (71.66%). It was also noted that seven variables were found statistically correlated with the knowledge gap of vegetable production technology. out of seven correlated variables, four variables such as farming experience, contact with extension personnel in public and private sector and social participation were found to be highly significant at 0.001 level of probability and three variables such as education, overall

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annual income and annual income from vegetable farming were found to be highly significant at 0.005 level of probability. The variables age and land holding had positive but both variables were found to be non-significant. Therefore, it was concluded that there is a high need of increasing their knowledge level as well as skills about the production of vegetables.

1. INTRODUCTION

Vegetables are store houses of micronutrients and macronutrients. They contain abundant amount of minerals, vitamins, carbohydrates, carotenoids and phytochemicals. As we see the scope of Bihar in terms of vegetable production, we can't ignore its importance on the map of Indian vegetable producing states. Being able to produce almost all kinds of vegetables whether it is solanaceous, Cole crops and root crops, there is a high expectation from Bihar in terms of production as well as productivity. The latest vegetable production scenario states that 498.53 thousand hectares of area produced approximately 7654.43 thousand metric tons of production during 2005-06 and it increased to 912.21 thousand hectares with 15968.25 thousand metric tons in 2014-15 (Agriculture Department, Govt. of Bihar). Women are actively involved in almost all stages of vegetable production right from production to marketing. This cleared the picture that there is a lot of scope of enhancing the production and productivity of vegetable crops by recommending proper production techniques and skills to women vegetable growers. Farm women can easily trained through organizing and conducting training programmes which has the ability of reaching a large number of farm women within a short span of time. The need based training could definitely prove to be an income generation catalyst among vegetable growers whether it could be men or women. This may increase their knowledge level as well as skills about the production of vegetables resulting the possibility of high returns and production from the vegetable production. But it is very much essential to determine the knowledge gap among farm women. This would be helpful in knowing their needs for increasing the efficiency and for better planning and monitoring of training. One of the aims of this study is to identify the understanding level of farm women and how this understanding could be driven towards more income generation from vegetable sector. This study would also be helpful in analysing the different aspects of training needs among farm women and beneficial to establish the relationship between different selected variables either dependent or independent.

Nearly 60 per cent women play a key role in home garden vegetable cultivation [1]. Knowledge level of respondents among different technological components viz., seed sowing management and field management were perceived as more important, whereas plant protection measures, harvesting, fertilizer management, weed management, irrigation and storage of less important and also low knowledge level regarding improved vegetable production technology [2]. Farm women possessed poor knowledge regarding different activities such as improved varieties, disease management and IPM, spacing, seed treatment, weed control and fair knowledge regarding different activities such as sowing time, harvesting and seed rate [3]. Nearly, 62.50 per cent farm women had knowledge about high yielding varieties, whereas, only 53.33 per cent farm women had knowledge about recommended doses of fertilizers [4]. Women succeeded in gaining knowledge after exposing them to media package on vegetable cultivation practices [5].

2. METHODOLOGY

Descriptive research design was used for this present study during the year 2017-19 in Bhagalpur district. Out of 16 blocks of Bhagalpur district, only one block named, Sabour was selected purposively as a study area for the reason that potentiality of growth of vegetables crops throughout the year due to favourable agro climatic conditions and near to the gangetic plain. Under this block, four villages named, Badi Dhankar, Chhoti Dhankar, Chhoti Ibrahimpur and Sardho which have maximum number of women vegetable growers were selected for further research work. Thirty women vegetable growers were taken from each of the selected village. Thus a total number of 120 women vegetable growers was constituted as the sample for the present study. Data was collected from the women vegetable growers through structured schedule on their houses or farms. A total of ten

major vegetable production areas such as agronomical practices, land preparation, seed rate, fertilizer management, irrigation management, weed management, insect pest management, disease management, sowing time and harvesting were considered for determining the knowledge gap. Questionnaire was specially developed for the study with MCQ question. Knowledge Gap was assessed with the help of following formula and it was presented in per cent.

Knowledge Gap= ((Total no.of questions in the scale- No. of right answer given by the respondents)/ Total no.of questions in the scale) × 100

The respondents were then grouped into low, medium and high categories using above formula.

3. RESULTS AND DISCUSSION

The results concerning knowledge gap in agronomical practices of Table 1 revealed that most of the farm women fall equally in the range of 41-60% and 61-80% category with 38.33% in

each category while none of the farm women were present in >80% category.

From the Table 2, it was found that most of the farm women (83.33%) come under medium level of category about knowledge gap in agronomical practices followed by low and high indicating per cent of 10.00 and 06.67 respectively.

The results concerning knowledge gap in land preparation of Table 3 showed that most of the farm women fall under the range of 61-80% category with 56.67% while none of the farm women were present in up to 20% and 21-40% category.

From the Table 4, it was found that most of the farm women (56.67%) come under medium level of category about knowledge gap in land preparation followed by low and high indicating per cent of 28.33 and 06.67 respectively.

From the Table 5 it is clear that most of the farm women fall under the range of 61-80% category with 68.34% while none of the farm women present under the category of up to 20% and 21-40%.

Table 1. Distribution of farm women as per their knowledge gap in agronomical practices

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	6	05.00
2	21-40%	22	18.34
3	41-60%	46	38.33
4	61-80%	46	38.33
5	>80%	0	00.00
	Total	120	100

Table 2. Distribution of farm women as per their level of knowledge gap in agronomical practices

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 39%)	12	10.00
2	Medium (>39% to 72%)	100	83.33
3	High (More than 72%)	8	06.67
	Total	120	100
Mean = 55.83, S.D. = 16.53			

Table 3. Distribution of farm women as per their knowledge gap in land preparation

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	0	00.00
2	21-40%	0	00.00
3	41-60%	34	28.33
4	61-80%	68	56.67
5	>80%	18	15.00
	Total	120	100

Table 4. Distribution of farm women as per their level of knowledge gap in land preparation

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 60%)	34	28.33
2	Medium (>60% to 85%)	68	56.67
3	High (More than 85%)	18	06.67
	Total	120	100
Mean = 72.83, S.D. = 12.45			

Table 5. Distribution of farm women as per their knowledge gap in seed rate

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	0	00.00
2	21-40%	0	00.00
3	41-60%	28	23.33
4	61-80%	82	68.34
5	>80%	10	08.33
	Total	120	100

Data of Table 6 showed that most of the farm women (68.34%) have medium level (>62% to 83%) of knowledge gap in seed rate followed by 23.33% farm women have low (up to 62%) and 08.33% farm women have high (more than 83%).

The findings of above Table 7 regarding knowledge gap in fertilizer management noted that majority of the farm women (71.67%) fall under the range of 41-60% category. While none of the farm women come under the range of up to 20% and >80% category.

It was noted from Table 8 that majority of the farm women (71.67%) have medium level (>47% to 68%) of knowledge gap in fertilizer management followed by 18.33% farm women have high (more than 68%) and 10.00% farm women have low (up to 47%).

Table 9 disclosed that majority of the farm women fall under the range of 41-60% category with 75.00% while none of the farm women were present under the range of up to 20% category.

From Table 10 revealed that most of the farm women (75.00%) have medium level of knowledge gap in irrigation management

followed by high (18.33%) and low (06.67%) respectively.

From the results (Table 11) regarding knowledge gap in weed management it could be inferred that majority of the farm women (40.00%) fall under the range of 21-40% category with 40.00% while 01.67% farm women were present in >80% category.

From the Table 12, it was concluded that most of the farm women (61.67%) have medium level of knowledge gap in weed management followed by low (23.33%) and high (15.00%) respectively.

The findings of Table 13 regarding knowledge gap in insect pest management noted that most of the farm women (50.00%) fall under the range of 41-60% category while none of the farm women were present under the range of up to 20% category and >80% category.

On the whole, it was clear from Table 14 that most of the farm women (71.66%) have medium level of knowledge gap in insect pest management followed by high (16.67%) and low (11.67%) respectively.

Table 6. Distribution of farm women as per their level of knowledge gap in seed rate

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 62%)	28	23.33
2	Medium (>62% to 83%)	82	68.34
3	High (More than 83%)	10	08.33
	Total	120	100
Mean = 72.33, S.D. = 10.43			

Table 7. Distribution of farm women as per their knowledge gap in fertilizer management

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	0	00.00
2	21-40%	12	10.00
3	41-60%	86	71.67
4	61-80%	22	18.33
5	>80%	0	00.00
	Total	120	100

Table 8. Distribution of farm women as per their level of knowledge gap in fertilizer management

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 47%)	12	10.00
2	Medium (>47% to 68%)	86	71.67
3	High (More than 68%)	22	18.33
	Total	120	100
	Mean = 57.33, S.D. = 10.19		

Table 9. Distribution of farm women as per their knowledge gap in irrigation management

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	0	00.00
2	21-40%	8	06.67
3	41-60%	90	75.00
4	61-80%	20	16.67
5	>80%	2	01.66
	Total	120	100

Table 10. Distribution of farm women as per their level of knowledge gap in irrigation management

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 47%)	8	06.67
2	Medium (>47% to 69%)	90	75.00
3	High (More than 69%)	22	18.33
	Total	120	100
	Mean = 58.00, S.D. = 11.12		

Table 11. Distribution of farm women as per their knowledge gap in weed management

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	8	06.67
2	21-40%	48	40.00
3	41-60%	46	38.33
4	61-80%	16	13.33
5	>80%	2	01.67
	Total	120	100

Table 12. Distribution of farm women as per their level of knowledge gap in weed management

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 31%)	28	23.33
2	Medium (>31% to 64%)	74	61.67
3	High (More than 64%)	18	15.00
	Total	120	100
	Mean = 47.33, S.D. = 16.18		

Table 13. Distribution of farm women as per their knowledge gap in insect pest management

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	0	00.00
2	21-40%	14	11.67
3	41-60%	60	50.00
4	61-80%	46	38.33
5	>80%	0	00.00
	Total	120	100

Table 14. Distribution of farm women as per their level of knowledge gap in insect pest management

Sl. No.	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 47%)	14	11.67
2	Medium (>47% to 73%)	86	71.66
3	High (More than 73%)	20	16.67
	Total	120	100
Mean = 60.33, S.D. = 13.09			

Table 15. Distribution of farm women as per their knowledge gap in disease management

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	2	01.67
2	21-40%	6	05.00
3	41-60%	38	31.67
4	61-80%	52	43.33
5	>80%	22	18.33
	Total	120	100

The results concerning knowledge gap in disease management of Table 15 disclosed that most of the farm women fall under the range of 61-80% category with 43.33% while 01.67% farm women were present in the range of up to 20% category.

From the Table 16, it was concluded that most of the farm women (58.34%) come under medium level of category about knowledge gap in disease management followed by low and high indicating percentages of 23.33 and 18.33 respectively.

Table 16. Distribution of farm women as per their level of knowledge gap in disease management

Sl. No	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 56%)	28	23.33
2	Medium (>56% to 82%)	70	58.34
3	High (More than 82%)	22	18.33
	Total	120	100
Mean = 69.00, S.D. = 13.37			

Table 17. Distribution of farm women as per their knowledge gap in sowing time of the crops

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	64	53.33
2	21-40%	48	40.00
3	41-60%	8	06.67
4	61-80%	0	00.00
5	>80%	0	00.00
	Total	120	100

Table 17 revealed that most of the farm women fall under the range of up to 20% category with 53.33% while none of the farm women were come under the categories of 61-80% and >80%.

Table 18 clear that most of the farm women (60.00%) come under medium level of category about knowledge gap in sowing time of the crops followed by low and high indicating percentages of 21.67 and 18.33 respectively.

The findings of Table 19 regarding knowledge gap in harvesting of the vegetable crops noted that majority of the farm women (46.67%) fall under the range of 21-40% category while none of the farm women come under the range of >80% category.

It was also noted from Table 20 that majority of the farm women (60.00%) have medium level (>17% to 37%) of knowledge gap in harvesting of vegetable crops followed by 20.00% farm women have high (more than 37%) and 20.00% farm women have low (up to 16%).

Above study revealed that majority of the women vegetable growers were come under medium category of knowledge gap level. More likely reason for this finding might be due to medium socio-economic status and education, low media exposure, low extension activities and farming experience. A similar finding was reached by Bhople and Sinde [6], Barodia et al. [2], Sharma et al. [7].

Relationship of selected socio-economic variables with knowledge gap of vegetable production technology

Table 21 revealed that out of nine variables studied, seven variables were found statistically correlated with the knowledge gap of vegetable production technology. These variables are education, farming experience, annual income, annual income from vegetable farming, contact with extension personnel in public and private sector and social participation. Further, out of seven correlated variables, four variables were found to be highly significant at 0.01 level of probability and three variables were found to be

Table 18. Distribution of farm women as per their level of knowledge gap in sowing time of the crops

Sl. No	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 13%)	26	21.67
2	Medium (>13% to 38%)	72	60.00
3	High (More than 38%)	22	18.33
	Total	120	100
	Mean = 25.50, S.D. = 12.76		

Table 19. Distribution of farm women as per their knowledge gap in harvesting of the vegetable crops

Sl. No.	Knowledge gap range	Frequency (*f*)	Per cent (%)
1	Up to 20%	40	33.33
2	21-40%	56	46.67
3	41-60%	22	18.33
4	61-80%	2	01.67
5	>80%	0	00.00
	Total	120	100

Table 20. Distribution of farm women as per their level of knowledge gap in harvesting of the vegetable crops

Sl. No	Categories	Frequency (*f*)	Per cent (%)
1	Low (Up to 16%)	24	20.00
2	Medium (>17% to 37%)	72	60.00
3	High (More than 37%)	24	20.00
	Total	120	100
	Mean = 31.50, S.D. = 15.86		

Table 21. Relationship of selected socio-economic characteristics with their knowledge gap of vegetable production technology

Sl. No.	Independent variables	Value of correlation coefficient (r)
1	Age	0.026
2	Education	-0.206*
3	Farming experience	-0.424**
4	Land holding	0.054
5	Annual income	- 0.218*
6	Annual income from vegetable farming	- 0.210*
7	Contact with extension personnel (public)	-0.308**
8	Contact with extension personnel (private)	-0.392**
9	Social participation	-0.312**

*** = Correlation is Significant at the 0.01 level,*
** = Correlation is Significant at the 0.05 level*

highly significant at 0.05 level of probability. The variables age and land holding had positive but both variables were found to be non-significant. It means that these variables didn't have significant role on the knowledge gap of vegetable production technology. These findings are in line with the results of Chandrakala and Eswarappa [8].

It was concluded from the study that as the respondents' education, farming experience, annual income, participation in extension and social activities increases the knowledge gap related vegetable production technology decreases simultaneously or in other words, as the respondents' education, farming experience, annual income, participation in extension and social activities increases the knowledge related vegetable production technology increases simultaneously.

4. CONCLUSION

This research study shows that the respondent's knowledge gap on ten major areas of vegetable production technologies such as agronomical practices, land preparation, seed rate, fertilizer management, irrigation management, weed management, insect pest management, disease management, time of sowing and harvesting of crops was more than 50 percent. It may be due to women vegetable growers did not receive any training from the public extension agencies; rather most of them depend on agri-input dealers. Therefore, it is recommended to conduct meaningful and effective training programmes based on the identified broad areas of training need for enhancing accurate knowledge and skill development of farm women.

CONSENT

As per international standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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