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ASSESSMENT OF EFFECTIVENESS OF FARMER FIELD SCHOOL (FFS) ON CHICKPEA PRODUCTION UNDER K.V.K., ATMA CONVERGENCE IN LALITPUR DISTRICT OF U.P., INDIA

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ABSTRACT

The present study on conception of Farmer Field School (FFS) on chickpea production, its purpose for sustainable cultivation in the bundelkhand zone of U.P. Farmer Field School Approach (FFS) is grounded on the generalities and principles of people cantered literacy and were the answers for themselves. That means the growers can develop results to their own problems and developed as volition to the conventional top-down test and verification of the old extension approaches. The present total 120 respondents, 60 FFS and 60 Non FFS farmers purposively selected during F.Y. 2019- 20 to 2021- 22 from Talbehat and Jakhaura Block of Lalitpur district of U.P.To assess effectiveness of Farmer Field School (FFS) on chickpea production under KVK and ATMA convergencein district Lalitpur, U.P. The result revealed that an overall grain yield increase of 19.94% over farmers' practices was recorded.

Key words : Farmer Field School, Effectiveness, Extension gap, Technology gap.

Introduction

The farmer field school (FFS) approach is a good example of participatory extension, vertical and horizontal spread of the FFS extension approach of educating farmers is impressive. FFS now has a presence in at least 78 nations, spanning from Asia to South Africa, Latin America, East Europe and the United States (Braun *et al*, 2006). They are a participatory method of learning, technology development and dissemination (FAO, 2001) based on adult learning principles such as experiential learning (Davis and Place, 2003). The first FFS was designed and managed by the Food and Agriculture Organization (FAO) of the United Nations in Indonesia in 1989 to train the trainers and farmers on Rice-Integrated Pest Management (IPM) technology in a participatory mode (Matata *et al.*, 2010). FFSs were conceptualized between 1970s, 1980s and first implemented in Indonesia in 1989 (Pontius *et al.*, 2002). Rola *et al.* (2002) and Mwagi *et al.* (2003) reported that farmers who had received FFS training performed better in a test of knowledge than farmers, who had not received FFS training. The FFS is a non-formal training programme for selected farmers within a locality, usually a village. The Farmer Field School Extension Model FFS are platforms and "schools without walls" for improving decision-making capacity of farming communities and stimulating local innovation for sustainable agriculture (Braun and Graham, 2000). FFS offers community- based non-formal education to groups of 20-25 farmers through self-discovery and participatory learning principles. The learning process is based on agro-ecological principles covering a cropping cycle. The school brings together farmers who live in the same village/catchment and, thus, share the same ecological setting and socioeconomic and political situation. FFS provides opportunities for learning-by-doing. Extension workers, subject matter specialists or trained farmers facilitate the learning process, encouraging farmers to discover key agro ecological concepts practiced in the field. During the learning, all the stakeholders participate on an equal basis in field observations, discussions and in applying their previous experiences and new information from outside the community to reach management decisions on the appropriate action to take for increased production. The FFS model is an example of group-based experiential learning (or "learning by-doing") that encourages farmers in "informal schools" to meet once a week in the same farmer's field and analyse and discuss their farming operations and then determine which agricultural interventions should be adopted and evaluated on their own farms. Normally, 20 to 30 neighboring farmers gather for group study on a member's farm once a week for about 14 weeks in a typical growing season. The overall objectives of FFS are to bring farmers together to carry out collective and collaborative inquiry with the purpose of initiating community action and solving community problems (Oduori, 2002). The facilitator assists the group in using actual real-life events rather than imagined experiences in FFS group meetings, practical exercises and trial plots. All of these activities follow Kolb's learning cycle (Kolb, 1984), in which farmers use factual observations to reflect on their experiences and then conceptualize the learning points on which actions are based. Keeping these points in view, to study the concept of FFS taking chickpea as the major crop enterprise.

Materials and Methods

The present study was conducted by KVK Lalitpur in two blocks Talbehat and Jakhaura. Out of 10 FFS villages were five villages (Bamhurisar, Purakalan, Bhuchera, Bijarautha and Dailwara) randomly selected, each F.F.S village have 12 trained farmer were selected. Thus the total 60 respondent were selected purposively for these three F.F.S villages. Whereas, 60 non trainees

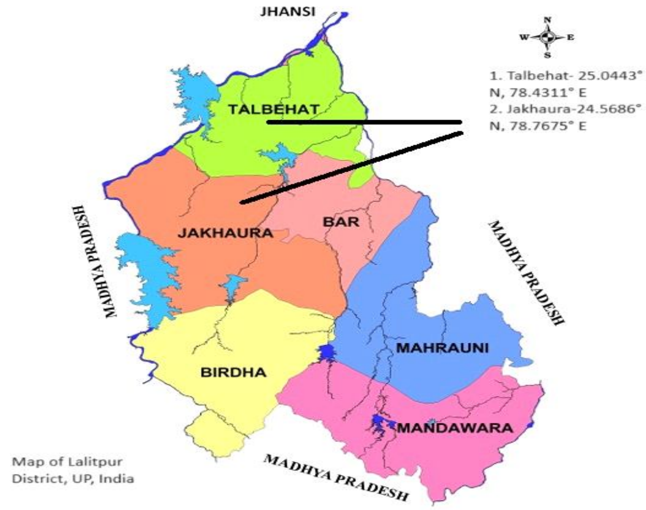

Fig. 1 : Map of study area.

of these villages were selected randomly for the sample of the study, therefore 120 respondents covered in the sample. The data were collected through a well-structured and pre-tested interview schedule. The researcher personally met the respondents and explained to them about the purpose of this study. The data were collected and recorded in the pre tested and well-structured with maintain the face validity and pre tested reliability interview schedule.

Extension gap = Demonstration yield – Farmers yield

Technology gap = Potential yield – Demonstration yield

$$\text{Technology Index (\%)} = \frac{\text{Technology gap} \times 100}{\text{Potential yield}}$$

The demonstration under FFS was of 0.4ha in area. Improved variety of Chickpea (RVG 202) was tested through Front Line Demonstrations with the following interventions (Table 1) and compared with local variety

Table 1 : Details of existing farmers' practices and proven technology for Chickpea cultivation.

Interventions	Farmers'practice	Scientific proven technology demonstrated
Seed	Locally available seed	Improved variety (RVG 202)
Seed rate	90 kg/ha	80 kg/ha
Sowing method	Broad casting	Line sowing by tractor operated seed cum fertilizer drill
Sowing time	Last week of September	1-15 October
Seed treatment	No seed treatment	Seed treatment with Bavistin (2g kg^{-1} seed) and Imidacloprid
Weed management	No weeding	Hand weeding at 30-35 DAS
Fertilizer application	Irregular use of fertilizers	FYM: 5 ton per hectare 40:40:0 kg N P K ha^{-1}, full dose of DAP and half dose of N applied at sowing, remaining N applied in standing crop
Plant protection measures	Irregular use of chemicals dust (15kg ha^{-1})	Foliar spray of Quinalphos 25 EC @ 1 L ha^{-1} and Imidacloprid 17.8SL @ 150ml ha^{-1} for the control of pod borers and sucking insects, respectively

grown with farmer's practices. In demonstration plots, a few critical inputs in the form of quality seed, balanced fertilizers, agro-chemicals were provided and non-monetary inputs like timely sowing in lines and timely weeding, irrigation and other inter cultural operations were also performed, whereas traditional practices were maintained in case of farmers' practice. The seed was treated with *Trichoderma viridae* (10 g perkg seed) and Bavistin (2 g per kg seed) in a closed container and then shade dried for some time before sowing. Trichoderma also applied as soil application @ 4.0 kg ha^{-1} mixed with 1.50qt. FYM to control the root-rot disease. Line sowing was performed with the help of multi seed cum fertilizer drill developed by CIAE, Bhopal. Phosphorous was supplied through DAP before sowing at the time of field preparation. Growing of locally available variety of Chickpea without seed treatment and application of only 30 kg ha^{-1} nitrogen at 65-70 days after sowing with indiscriminate use of pesticides and fungicides is the farmer's practice prevailing in the area. The sowing was done during the first week of October. The front-line demonstrations were conducted to study the gaps between the potential and demonstration yield, extension gap and technology index. Data with respect to yield and output for FFS plots and on local practices commonly adopted by the farmers of the area under study were recorded and analyses. The details of different parameters are as under: The present study was concentrated on cultivation practices of Chickpea. Ex-post facto research design was employed for conducting the study. Data were collected by using a detailed pretested interview schedule and PRA technique was employed wherever necessary. The information regarding knowledge about production technologies were gathered, scored, quantified, categorized, tabulated and interpreted using standard statistical methods.

Results and Discussion

Table 2 data reveals that Plant height (cm) which was higher Bijarautha village, within demonstration villages and also compare to farmers practice. Under FFS pods/plant were recorded 57.4 in the Bijarautha village, which was obtained highest compare to farmer practice. For seeds /pod highest 1.75 in demo practice in Bhuchera village. The highest seed weight (g) was found 190.10 in the Bijarautha village under FFS demonstrations carried out with improved cultivation practices.

Data presented in Table 3 revealed that an overall yield advantage of 19.94% over farmers' practices was recorded with the average grain yield. The results also accordance with the findings of Singh *et al*. (2019), Bhargav *et al*. (2015), Raj *et al*. (2013), Dubey *et al*. (2010) and Yadav *et al*. (2004). Findings for extension gap were found from 3.0 kg q ha^{-1} (Bamhurisar village) to 3.7 kg ha^{-1} (Dailwaravillage) and on average basis it was 3.1 kg ha^{-1}. This emphasized the need to educate

Table 2 : Growth and yield attributes influenced by technological interventions on chickpea.

Villages	Plant height (cm)		Pods/plant		Seeds/pod		1000 seed weight (g)	
	Demo	FP	Demo	FP	Demo	FP	Demo	FP
Bamhurisar	60.5	53.6	53.15	49.6	1.37	1.14	180.87	160.20
Purakalan	57.7	52.4	54.61	39.7	1.68	1.21	182.32	163.40
Bhuchera	59.3	56.2	55.81	41.3	1.75	1.25	185.30	162.40
Bijarautha	62.2	57.8	57.4	43.5	1.58	1.23	190.10	164.70
Dailwara	59.9	53.2	54.5	42.1	1.58	1.12	187.2	159.50
Overall average	299.6	273.2	275.47	216.2	7.96	5.95	925.79	810.2

Table 3 : Grain yield and gap analysis of technological interventions on Chickpea (RVG-202).

Villages	Area (ha)	Potential yield (q ha^{-1})	Demo yield (q ha^{-1})	FP yield (q ha^{-1})	Yield increase Over FP (%)	Ext gap (q ha^{-1})	Tech gap (q ha^{-1})	Tech Index (%)
Bamhurisar	0.4	20	19.3	16.3	18.4	3.0	0.7	3.5
Purakalan	0.4	20	18.7	15.9	17.6	2.8	1.3	6.5
Bhuchera	0.4	20	17.2	14.7	17.0	2.5	2.8	14.0
Bijarautha	0.4	20	18.9	15.4	22.7	3.5	1.1	5.5
Dailwara	0.4	20	19.1	15.4	24.0	3.7	0.9	4.5
Overall average	0.4	20	18.64	15.54	19.94	3.1	1.36	6.8

Demo. = Demonstration, FP = Farmers' practice, Ext. = Extension, Tech. = Technology.

Table 4 : Economics of Chickpea under technological interventions at farmers' field.

Villages	Total Cost (Rs. per ha)		Gross Returns (Rs. per ha)		Net Return (Rs. per ha)		B:C Ratio	
	Demo	FP	Demo	FP	Demo	FP	Demo	FP
Bamhurisar	23200	22500	100939	85249	77739	62749	3.3	2.7
Purakalan	22900	21300	97801	83157	74901	61857	3.2	2.9
Bhuchera	21986	19900	89956	76881	67970	56981	3.0	2.8
Bijarautha	21874	19800	98847	80542	76973	60742	3.5	3.0
Dailwara	20200	19980	99893	80542	79693	60562	3.9	3.0
Overall average	22032	20696	97487.2	81274.2	75455.2	60578.2	3.38	2.88

Table 5 : Constraints perceived by the Farmers in adoption of Chickpea production.

S. no.	Constraints	Farmers (N=60)	Rank
1	Unavailability of improved seed variety	54	I
2	Unavailability of seed at time	36	IX
3	Unavailability of loan at time	40	VII
4	Lack of proper resources and capital	53	II
5	Lack of knowledge and information about practices	51	III
6	Lack of training program regarding improved agriculture practices	38	VIII
7.	Inadequate irrigation facilities	49	IV
8	There is no visiting program of agricultural personnel in time to time	42	VI
9	High cost of agricultural resources	31	X
10	Lack of marketing facilities	46	V

the farmers through innovative methods for adoption of improved technology especially high yielding varieties sown with the help of seed cum fertilizer drill with balanced nutrition, sowing time, irrigation method and appropriate plant protection measures in demonstrations which resulted in higher grain yield than the traditional farmers' practices. These results are in agreement with the findings of Singh *et al*. (2011) in cumin and Tetarwal and Singh (2021) in groundnut crop. The investigation further exhibited a wide technology gapamong different fields. It was lowest (0.7 q ha^{-1}) in Bamhurisar village and highest (2.8 q ha^{-1}) in Bhuchera. The average technology gap of all the fields was 1.36 q ha^{-1}. The difference in technology gap in different fields is due to better performance of recommended varieties with different interventions and more feasibility of recommended technologies during the course of study with other factors like monitoring by farmers, soil type and fertility status of the fields. Similarly, the technology index for all demonstrations in the study was in accordance with the technology gap. Higher technology index reflected the inadequate proven technology for transferring to farmers and insufficient extension services for transfer of technology. In this study, overall 6.8 per cent technology index was recorded. FFS training emphasizes building on the farmers' ability to experiment and draw conclusions and it empowers farmers to improve their socio-economic conditions (Asiabaka and James, 1999).

The economic analysis indicated that gross returns, net returns and benefit: cost ratios were also markedly influenced by improved production technologies as compared to farmer's practice. Gross return were (19.95%) highest increase in net returns (24.56%), benefit: cost ratio (17.36%) was observed with variety RVG 202 along this could be ascribed to the high yield potential of RVG 202 variety and effect of favorable growth environment. Similar findings were also reported by Sharma and Sharma (2014). Different variables like seed, fertilizers and pesticides were considered as cash inputs for the demonstrations under FFS as well as farmers' practices. Data of economic analysis presented in Table 4 exhibited that on overall average basis, an amount of Rs. 22032 ha^{-1} was incurred under FFS demonstrations and Rs. 20696 ha^{-1} under farmers' practice (FP). The results of the study confirm the findings of Tetarwal and Singh (2021) on groundnut; Singh *at al*. (2019) on pulses; Lathwal (2010) on black gram. FFS approach of increased farmers' capacity for research, innovation and informed decision-making subsequently increase in farmer's income as reported by Ashby *et al*. (2000).

Table- 6 : Suggestions to eradicate constraints in non-adoption of improved chickpea production technology

S. no.	Suggestions	Farmers (N= 60)	Rank
1	Improved seed variety should be provided at right time	42	I
2	Loan should be available easily and at low rate of interest	31	VI
3	The fertilizer and other inputs should be available at time	38	III
4	Trainings programme should be organized in time to time regarding technical knowledge.	40	II
5	Information regarding plant protection manures should be available at right time.	34	V
6	There should be regular field visit of agricultural personnel in time to time	36	IV
7	The irrigation should be available at time	27	VII
8	The input should be provided at low cost to poor and small farmers.	24	IX
9	There should be proper marketing system in the area	26	VIII

The data regarding constraints in adoption of recommended Chickpea agricultural practices by farmers are presented in Table 5 data revealed the various constraints and impediments faced by the farmers in adoption of Chickpea production technology. Hence, opinions of members on constraints in adoption of improved practices have been obtained and their rank order is presented in the Table 5. The data showed the distribution of members according to the constraints perceived in adoption of improved Chickpea production technology.

Conclusion

These promising technologies were validated and disseminated through Farmer Field School (FFS) approach only. FFS as a participatory extension methodology recognizes the need to involve farmers in technology development and transfer successfully programs in the field and regular follow up encounters with individual farmers leading to higher adoption of chickpea by the farmers.

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