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ASSESSMENT OF FARMERS' PERCEPTION TOWARDS CLUSTER FRONTLINE DEMONSTRATIONS ON IMPROVED OILSEED PRODUCTION TECHNOLOGIES

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ABSTRACT

Cluster Frontline Demonstrations (CFLDs) are an important extension approach for demonstrating improved agricultural technologies under farmers' field conditions and facilitating their wider adoption. The present study was conducted to assess the perceived effectiveness of CFLDs in promoting improved production technologies and management practices among oilseed farmers. A total of 120 farmers comprising 60 CFLD beneficiaries and 60 non-beneficiaries were selected for the study. Data were collected using a structured interview schedule covering farmers' perceptions regarding improved varieties, seed treatment, nutrient management, soil amendments, weed and pest management, irrigation, input availability, cost reduction, decision-making, training, market-oriented benefits and interaction with scientists. Beneficiaries' responses were measured using a five-point continuum ranging from strongly agree to strongly disagree. The results revealed a highly favourable perception among CFLD beneficiaries towards the demonstrated technologies. A substantial proportion of beneficiaries agreed or strongly agreed that CFLD demonstrations improved their understanding and adoption of new practices, strengthened their decision-making ability, improved access to quality inputs, reduced input costs and enhanced crop performance. Farmers also expressed favourable perceptions regarding seed treatment, nutrient management, gypsum and lime application, micronutrients, biofertilizers, irrigation scheduling, pest and disease management, and improved harvesting practices. The demonstrations were also perceived to provide opportunities for interaction with scientists and improve farmers' confidence in oilseed cultivation. The findings indicate that CFLDs can serve as an effective field-based extension mechanism for enhancing farmers' knowledge, confidence and adoption of improved oilseed production technologies.

INTRODUCTION

Oilseed crops occupy an important position in Indian agriculture because they contribute significantly to edible oil production, farm income, nutritional security and diversification of agricultural production. However, oilseed productivity in many regions remains constrained by inadequate adoption of improved production technologies, imbalanced nutrient management, poor seed quality, pest and disease problems, inefficient water management and limited access to timely technical information. Bridging the gap between the availability of improved agricultural technologies and their adoption at the farm level is therefore an important challenge for agricultural extension systems. Frontline demonstrations provide an opportunity to demonstrate the performance of recommended technologies under actual farmers' field conditions. Unlike conventional extension approaches that primarily depend on verbal communication, demonstrations enable farmers to observe the technology, compare its performance and understand its practical application. Such experiential learning can contribute to greater confidence in the recommended practices and facilitate technology adoption.

The Cluster Frontline Demonstration (CFLD) programme was introduced to provide a cluster-based approach for demonstrating improved technologies in important agricultural crops, including oilseeds. Under CFLDs, farmers are exposed to improved varieties and production technologies through demonstrations, training programmes, technical guidance and interaction with agricultural scientists and extension personnel. The approach is particularly relevant to oilseed production because a number of productivity-enhancing technologies, such as improved seed, seed treatment, balanced nutrient management, micronutrient application, soil amendments, integrated pest management, efficient irrigation and improved harvesting practices, need to be demonstrated practically for effective adoption. The effectiveness of a demonstration programme cannot be assessed only through the area covered or number of farmers reached. Farmers' perceptions provide important evidence regarding the usefulness, understandability and practical relevance of the technologies demonstrated. Positive perceptions can strengthen farmers' confidence and encourage continued use of improved practices, whereas unfavourable perceptions may indicate technological, economic or extension-related barriers requiring further attention. The present study therefore focused on assessing farmers'

perceptions regarding the effectiveness of CFLDs on oilseed crops. The study examined the extent to which CFLD exposure was perceived to improve farmers' knowledge, adoption of improved technologies, input management, resource-use efficiency, decision-making ability, economic benefits and interaction with scientists. A comparison of CFLD beneficiaries and non-beneficiaries was also considered to understand the perceived contribution of the programme in the selected study area.

METHODOLOGY

The study was conducted using an ex-post facto research design, as the CFLD intervention had already been implemented and the researcher did not manipulate the independent variables. The design was considered appropriate for assessing farmers' perceptions regarding the technologies demonstrated under CFLDs and comparing beneficiaries with non-beneficiaries. The study included a total sample of 120 farmers, consisting of 60 CFLD beneficiaries and 60 non-beneficiaries. CFLD beneficiaries were farmers who had participated in or received the benefits of Cluster Frontline Demonstrations on oilseed crops. Non-beneficiaries were selected from the same study area who had not directly participated in the CFLD programme. The beneficiary and non-beneficiary groups were maintained separately to facilitate comparison of their responses.

Primary data were collected through a structured interview schedule developed for the study. The schedule included statements related to the usefulness and effectiveness of CFLD interventions in oilseed cultivation. The statements covered improved varieties, advisory services, seed treatment, nutrient management, gypsum and lime application, weed management, pest and disease management, micronutrients, biofertilizers, availability of quality seed and inputs, irrigation scheduling, sprinkler and drip irrigation, harvesting and post-harvest management, input costs, farmers' confidence, decision-making ability, economic well-being and interaction with scientists. The schedule contains 25 perception statements. These statements were designed to capture farmers' responses to different dimensions of CFLD effectiveness, including production, economic, technological and extension-related outcomes.

Measurement of Perception

Farmers' perceptions were measured using a five-point continuum, namely: Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD)

For each statement, respondents indicated the extent to which they agreed with the statement. Frequencies and percentages were calculated for each response category. The uploaded data specifically record the responses of both beneficiaries and non-beneficiaries using this five-point scale. The collected data were subjected to descriptive statistical analysis. Frequency and percentage were calculated for each perception statement separately for CFLD beneficiaries and non-beneficiaries. The responses were interpreted to determine the overall direction of farmers' perceptions towards CFLDs. The results were presented in tabular form and discussed statement-wise to identify the major areas in which farmers perceived CFLDs to be useful in improving oilseed production practices, knowledge, confidence, decision-making and economic outcomes.

RESULTS AND DISCUSSION

The beneficiaries' perceptions regarding the effectiveness of Cluster Frontline Demonstrations (CFLDs) on oilseed crops were assessed using 25 statements covering improved production technologies, input management, resource-use efficiency, decision-making, economic benefits and interaction with scientists. The responses were recorded on a five-point continuum ranging from strongly agree to strongly disagree. A highly favourable response was observed for the statement that CFLD demonstrations provided good opportunities for interaction with scientists. About 55.00 per cent of beneficiaries strongly agreed and 45.00 per cent agreed with this statement, indicating that direct interaction with scientists was an important component of the CFLD programme. Such interaction could have helped farmers clarify their technical doubts and improve their understanding of recommended oilseed production practices.

Similarly, 51.66 per cent of beneficiaries strongly agreed and 48.34 per cent agreed that the trainings and demonstrations conducted under CFLDs were sufficient to impart complete knowledge of improved production technologies. Thus, all beneficiaries expressed either strong or moderate agreement with the statement, demonstrating the perceived importance of practical demonstrations and training in strengthening farmers' technical knowledge. The findings also showed a strong perception regarding the ease of understanding and adoption of new practices. About 40.00 per cent strongly agreed and 56.67 per cent agreed that CFLD demonstrations were easy to understand and helped them adopt new practices. Only 3.33 per cent remained undecided, while none of the respondents disagreed. This suggests that the practical and field-based nature of CFLDs may have facilitated learning by allowing farmers to observe recommended practices under actual field conditions.

Table: Distribution of CFLD beneficiary and non-beneficiary farmers according to their perception on CFLDs on oilseeds technologies

(n=120)

S. No	Statements	Beneficiaries (n=60)					Non-beneficiaries (n=60)				
		SA F (%)	A F (%)	UD F (%)	D F (%)	SD F (%)	SA F (%)	A F (%)	UD F (%)	D F (%)	SD F (%)
1	CFLDs technologies on oilseeds helped me in selection of improving high-yielding varieties	14 23.33	36 60.00	7 11.67	5 8.33	0 0.00	0 0.00	18 30.00	17 28.34	18 30.00	7 11.67
2	CFLDs on oilseeds provided timely and relevant advisory services	26 43.35	28 46.66	4 6.66	2 3.33	0 0.00	0 0.00	10 16.67	20 33.33	19 31.66	11 18.34
3	Technologies for seed treatment under CFLDs on oilseeds improved germination and reduced seed-borne diseases	18 30	34 56.66	7 11.67	1 1.67	0 0.00	0 0.00	6 10.00	24 40.00	19 31.66	11 18.34
4	Under CFLDs on oilseeds nutrient management techniques had increased my crop growth and yield	26 43.33	28 46.66	5 8.34	1 1.67	0 0.00	0 0.00	12 20.00	17 28.33	18 30.00	13 21.67
5	After exposure to CFLDs on oilseeds I adopted application of gypsum and lime	23 38.34	29 48.33	7 11.67	3 5.00	0 0.00	0 0.00	0 0.00	29 48.33	25 41.67	6 10.00
6	The application of gypsum demonstrated under CFLDs had enhanced pod development and yield	19 31.67	30 50.00	7 11.67	2 3.33	2 3.33	0 0.00	0 0.00	30 50.00	25 41.67	5 8.33

7	CFLD demonstrations made me understand and adopt need based fertilizers application in oilseeds	17 28.34	33 55.00	8 13.33	2 3.33	0 0.00	0 0.00	7 11.67	20 33.33	24 40.00	9 15.00
8	Weed management methods based on CFLDs had reduced weed incidence effectively in oilseeds	21 35.00	27 45.00	9 15.00	0 0.00	3 5.00	0 0.00	11 18.34	17 28.33	22 36.66	10 16.66
9	Improved pest and disease management practices (pheromone traps and neem-based sprays) were very helpful in protection of oilseed crops	22 36.67	33 55.00	4 6.67	1 1.66	0 0.00	3 5.00	10 16.66	16 26.67	24 40.00	7 11.67
10	Application of micronutrients demonstrated under CFLD had enhanced crop health in oilseeds	25 41.66	23 38.34	7 11.67	3 5.00	2 3.33	0 0.00	12 20.00	20 33.33	18 30.00	10 16.67
11	Application of biofertilizers advised under CFLDs had improved soil fertility and sustainability	19 31.67	30 50.00	8 13.34	2 3.33	1 1.66	0 0.00	15 25.00	15 25.00	21 35.00	9 15.00
12	CFLDs made timely access to essential inputs and high quality seeds on time in cultivation of oilseeds	25 41.67	33 55.00	0 0.00	2 3.33	0 0.00	0 0.00	17 28.33	19 31.67	16 26.66	8 13.34
13	CFLDs on oilseeds helped me in reducing my input costs	21 35.00	36 60.00	0 0.00	3 5.00	0 0.00	0 0.00	12 20.00	18 30.00	20 33.33	10 16.67
14	CFLD trainings had improved my confidence in	27 45.00	29 48.34	1 1.66	3 5.00	0 0.00	0 0.00	18 30.00	20 33.33	19 31.67	3 5.00

	oilseed farming										
15	The recommended irrigation scheduling under CFLD on oilseeds had improved my water use efficiency	21 35.00	33 55.00	3 5.00	3 5.00	0 0.00	2 3.33	17 28.33	21 35.00	14 23.34	6 10.00
16	Use of sprinkler and drip irrigation which was demonstrated were beneficial to farmers under CFLDs on oilseeds	25 41.67	33 55.00	0 0.00	2 3.33	0 0.00	2 3.33	19 31.67	20 33.33	13 21.67	6 10.00
17	CFLDs had encouraged in timely harvesting and post-harvesting management of oilseed crops	18 30.00	35 58.34	4 6.66	3 5.00	0 0.00	3 5.00	7 11.67	24 40.00	16 26.67	10 16.66
18	CFLDs helped me to improve quality of oilseeds produce for better market price and also reducing my input costs	25 41.66	27 45.00	5 8.34	3 5.00	0 0.00	4 6.66	12 20.00	20 33.34	14 23.34	10 16.66
19	Participation in CFLD helped me diversify into other oilseed crops and reduce dependency on other advisory services	22 36.66	35 58.34	0 0.00	3 5.00	0 0.00	3 5.00	11 18.33	19 31.67	18 30.00	9 15.00
20	CFLDs had improved my ability to make timely decisions in management of oilseeds	30 50.00	27 45.00	3 5.00	0 0.00	0 0.00	5 8.33	10 16.67	21 35.00	15 25.00	9 15.00
21	Adoption of CFLDs on oilseeds had enhanced my	15 25.00	34 56.67	5 8.34	4 6.66	2 3.33	2 3.33	6 10.00	17 28.34	25 41.66	10 16.67

	social status and improved economic well being										
22	The CFLD demonstrations on oilseeds were very easy to understand and helped me to adopt new practices	24 40.00	34 56.67	2 3.33	0 0.00	0 0.00	2 3.33	12 20.00	20 33.33	18 30.00	8 13.34
23	CFLDs on oilseeds had encouraged our rural youth participation and reduced migration	16 26.67	32 53.33	7 11.67	3 5.00	2 3.33	4 6.66	7 11.67	22 36.66	16 26.66	11 18.33
24	Trainings and demonstrations provided under CFLDs on oilseeds after sufficient to impart complete knowledge on improved production technologies	31 51.66	29 48.34	0 0.00	0 0.00	0 0.00	1 1.66	6 10.00	28 46.67	18 30.00	7 11.67
25	CFLDs on oilseeds provided us to have good opportunities of interaction with scientists	33 55.00	27 45.00	0 0.00	0 0.00	0 0.00	2 3.33	5 8.33	30 50.00	15 25.00	8 13.34

With respect to timely decision-making in oilseed management, 50.00 per cent of beneficiaries strongly agreed and 45.00 per cent agreed that CFLDs improved their ability to make timely decisions. Only 5.00 per cent were undecided and none disagreed. This indicates that exposure to demonstrations and technical guidance may have strengthened farmers' confidence in making production-related decisions. The CFLDs were also perceived to have contributed to timely access to essential inputs and quality seed. About 41.67 per cent strongly agreed and 55.00 per cent agreed with this statement, whereas only 3.33 per cent disagreed. Timely availability of quality seed and other essential inputs is particularly important in oilseed production because delays in sowing and input application can adversely affect crop establishment and productivity.

Regarding nutrient management, 43.33 per cent of beneficiaries strongly agreed and 46.66 per cent agreed that nutrient management techniques demonstrated under CFLDs increased crop growth and yield. The high proportion of favourable responses indicates that farmers perceived the recommended nutrient-management practices as beneficial for improving crop performance. The findings further revealed favourable perceptions towards seed treatment. About 30.00 per cent strongly agreed and 56.66 per cent agreed that seed-treatment technologies demonstrated under CFLDs improved germination and reduced seed-borne diseases. This suggests that demonstrations helped farmers understand the practical benefits of seed treatment and encouraged greater acceptance of the practice. Similarly, the application of gypsum and lime was positively perceived. Nearly 38.34 per cent strongly agreed and 48.33 per cent agreed that exposure to CFLDs resulted in adoption of gypsum and lime application. The finding indicates that field demonstrations may have helped farmers recognise the importance of soil amendments in improving crop performance.

The role of CFLDs in weed and pest management was also evident. About 35.00 per cent strongly agreed and 45.00 per cent agreed that weed-management methods demonstrated under CFLDs effectively reduced weed incidence.

Likewise, 36.67 per cent strongly agreed and 55.00 per cent agreed that improved pest and disease-management practices, including pheromone traps and neem-based sprays, were helpful in protecting oilseed crops. The beneficiaries also expressed favourable opinions about micronutrient and biofertilizer application. For micronutrients, 41.66 per cent strongly agreed and 38.34 per cent agreed that their application enhanced crop health. In the case of biofertilizers, 31.67 per cent strongly agreed and 50.00 per cent agreed that their application improved soil fertility and sustainability. These results suggest that CFLDs helped expose farmers to improved and relatively knowledge-intensive input-management practices. A favourable response was also observed regarding irrigation management. About 35.00 per cent strongly agreed and 55.00 per cent agreed that recommended irrigation scheduling improved water-use efficiency. Further, 41.67 per cent strongly agreed and 55.00 per cent agreed that sprinkler and drip irrigation demonstrated under CFLDs were beneficial to farmers. These findings indicate that the demonstrations helped farmers appreciate improved water-management technologies and their potential contribution to efficient resource use.

In terms of economic outcomes, 35.00 per cent strongly agreed and 60.00 per cent agreed that CFLDs helped reduce input costs. Similarly, 41.66 per cent strongly agreed and 45.00 per cent agreed that CFLDs improved the quality of oilseed produce, helped obtain better market prices, and reduced input costs. These responses indicate that farmers associated the demonstrated technologies not only with agronomic improvements but also with potential economic benefits. The programme also appeared to influence farmers' confidence and social-economic perceptions. About 45.00 per cent strongly agreed and 48.34 per cent agreed that CFLD training improved their confidence in oilseed farming. Further, 25.00 per cent strongly agreed and 56.67 per cent agreed that adoption of CFLDs enhanced their social status and improved economic well-being. An important behavioural outcome was observed in relation to diversification and reduced dependence on advisory services. About 36.66 per cent strongly agreed and 58.34 per cent agreed that participation in CFLDs helped them diversify into other oilseed crops and reduce dependency on other advisory services. This indicates that repeated exposure to demonstrations and technical information may have enhanced farmers' capacity to make independent production decisions. The findings further indicated that CFLDs encouraged timely harvesting and post-harvest management, with 30.00 per cent strongly agreeing and 58.34 per cent agreeing with the statement. However, the response concerning rural youth participation and reduction in migration was comparatively less favourable, although 26.67 per cent strongly agreed and 53.33 per cent agreed. This suggests that the programme had a perceived positive influence on youth engagement, but the effect on migration may require longer-term assessment.

Overall, the results demonstrate that beneficiaries perceived CFLDs as a practical and effective extension intervention for improving knowledge, confidence, technology adoption, resource-use efficiency and oilseed production management. The consistently high proportion of beneficiaries selecting "agree" and "strongly agree" across most statements indicates broad acceptance of the demonstrated technologies. Particularly strong responses were observed for interaction with scientists, adequacy of training, ease of understanding demonstrations, timely decision-making, input availability and adoption of improved production practices. These findings suggest that the combination of field demonstrations, hands-on learning, technical guidance and scientist–farmer interaction was an important mechanism through which CFLDs facilitated the adoption of improved oilseed technologies.

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