Biological Forum – An International Journal **15(10): 39-46(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Exploring Constraints in the Adoption of Groundnut Production Technologies by CFLD Farmers: A Comprehensive Study

Sanskaran Swami[1], Rajesh Kumar Verma[2], Sanju Meena[1], Vijender Kumar[3*], Priyanka Yadav[3] and Shobhana Bishnoi[4]

[1]Ph.D. Scholar, Department of Agricultural Extension and Communication, College of Agriculture, SKRAU, Bikaner (Rajasthan), India.
[2]Professor and Assistant Director, Directorate of Extension Education, SKRAU, Bikaner (Rajasthan), India.
[3]Ph.D. Scholar, Department of Agricultural Economics and Management, Rajasthan College of Agriculture, MPUAT, Udaipur (Rajasthan), India.
[4]Ph.D. Scholar, Department of Agricultural Economics, College of agriculture, SKNAU, Jobner (Rajasthan), India.

(Corresponding author: Vijender Kumar)*
(Received: 07 July 2023; Revised: 15 August 2023; Accepted: 11 September 2023; Published: 15 October 2023)
(Published by Research Trend)

ABSTRACT: India is a developing country in which majority of the population lives in villages and their major occupation is agriculture. In India various crops has been cultivated in which Groundnut (*Arachis hypogaea*) is one of the most important oilseed crops in India. The ICAR has taken key initiative to enhance oilseeds and pulses production and productivity by conducting nationwide Cluster Front Line Demonstrations (CFLDs) through a wide network of Krishi Vigyan Kendras (KVK). Krishi Vigyan Kendra Bikaner continuously conducting the cluster frontline demonstration on groundnut since last five years (2016-2020) to enhance the rate of adoption of groundnut production technologies. An effort has been made to know the Constraints being faced by CFLD farmers in adoption of groundnut production technologies. The most important Constraints faced by the respondents in the adoption of groundnut production technologies demonstrated under CFLD were Unavailability of improved seeds at the time of sowing, High cost of improved seeds, unavailability of technical advice as and when needed, erratic rainfall and Constraints of marketing in remote areas.

Keywords: *Arachis hypogaea*, Cluster Front Line Demonstrations, Adoption, Constraints, KVK.

INTRODUCTION

Groundnut (*Arachis hypogaea*) is one of the most important oilseed crops in India. The groundnut crop plays significant role in the edible oilseed economy of India. Besides being a source of good quality cooking oil, the seeds of groundnut also provide expeller and extraction-cakes which are very rich in protein, are used extensively as animal feed supplement. India is the second largest producer of groundnut after China occupied an area of 4.89 million hectare and the production was 10.10 million tonnes with an average productivity around 2065 kg/ha during 2019-20 (Anonymous, 2020a).

ICAR launched an “On-farm Research Project” in 1988 for oilseeds. The success of On-farm Research generated tremendous interest among farmers, planners and administrators. Ultimately the Indian Council of Agricultural Research (ICAR) presented the idea of "First Line Demonstration" under the "Oilseed Technology Mission" and the GOI sanctioned First Line Demonstrations for oilseeds under the Ministry of Agriculture, in 1991. It was started by the All India Co-ordinate Research Project on oilseeds (AICORPO) with a network of 64 locations/centres and 104 functional units covering 8 crops (groundnut, rapeseed-mustard, sesame, niger, sunflower, castor, safflower and linseed) in 17 oilseed growing states (Rao, 1991). Later on, "First Line Demonstration" (FLD) was renamed as "Front Line Demonstration" to reflect the practice of researchers introducing new technologies directly to farmers in their own fields before integrating them into the broader extension system of the state's agricultural division. Front Line Demonstrations differ from conventional demonstrations conducted by extension agents.

The primary goal of FLD is to showcase the production potential of cutting-edge technologies within the context of farmers' own agricultural practices and gather direct feedback on the factors constraining the realization of the demonstrated technology's production potential. Additionally, FLD plays a role in fostering technical leadership at the village level by organizing tailored training programs based on farmers' specific needs. The Cluster Front Line Demonstration (CFLD) program for groundnut not only promises improved

yield realization but also presents an opportunity to enhance the production of high-quality seeds. This potential is firmly based on the adoption and continuous implementation of advanced management practices, rendering CFLD an appealing endeavour for wider adoption throughout agricultural regions (Ghosh *et al*., 2023). The improved technologies consisted of improved high yielding variety, pre-emergence weedicides, use of biofertilizers as a seed treatment, vermicompost, neem-based pesticides and yellow sticky card as insect-pest management (Bezbaruah and Deka 2020).

Front Line Demonstrations (FLDs) are meticulously coordinated by researchers within the National Agricultural Research System, which encompasses various entities such as ICAR Institutes, National Research Centres, Project Directorates, Krishi Vigyan Kendras, State Agricultural Universities, and Regional Research Stations. The National Mission on Oilseeds and Oil Palm (NMOOP), launched during 2014-15, has set its sights on augmenting the production and productivity of oilseed crops and oil palm. This objective is pursued by cultivating oilseed crops in previously fallow lands and shifting focus away from low-yield cereals. The mission is determined to reach its targets by tackling the primary constraints that impede crop productivity, primarily through the promotion of pertinent technological advancements. The utilization of advanced agronomic technologies has considerable potential to enhance groundnut productivity through cluster front-line demonstrations.

The Indian Council of Agricultural Research (ICAR) has taken a pivotal role in bolstering the production and productivity of oilseeds and pulses. This initiative is executed through the nationwide implementation of Cluster Front Line Demonstrations (CFLDs) via an extensive network of Krishi Vigyan Kendras. Previously, Front Line Demonstrations (FLDs) were conducted in a scattered manner across vast areas, making supervision and feedback collection a challenging endeavor. To address these issues, a cluster-based approach was introduced, leading to the establishment of the Cluster Front Line Demonstrations (CFLDs) program, which commenced in the year 2015-16.

The Cluster Front Line Demonstration Programme was initiated at the Krishi Vigyan Kendra (KVK) in Bikaner in the year 2016, and it has been ongoing since then. Having now completed five years of implementation at this particular KVK, it becomes imperative to assess the program's impact. The primary objective is to evaluate the extent to which this program has facilitated groundnut growers in effecting changes related to the adoption of groundnut production technologies. Additionally, it seeks to identify and understand the challenges encountered by groundnut growers in the process of adopting these technologies.

MATERIALS AND METHODS

The present investigation was conducted in the Bikaner district of Rajasthan state and it was chosen purposely. There are two Krishi Vigyan Kendra in Bikaner district namely KVK Bikaner and KVK Lunkaransar. KVK Bikaner was purposively chosen for this study due to its distinction as the leading groundnut-producing district in the state and the researcher's familiarity with the region and its local language, which facilitated the collection of dependable and genuine data. Bikaner district comprises eight tehsils namely Bikaner, Chhatargarh, Khajuwala, Kolayat, Lunkaransar, Nokha, Poogal and Dungargarh. Four tehsils namely Nokha, Dungargarh, Kolayat and Bikaner come under Krishi Vigyan Kendra (KVK) Bikaner. Out of these four tehsils, two tehsils Bikaner and Kolayat were selected purposively for the present study as the highest number of cluster front line demonstrations were conducted during 2016-2020.

To select respondents for the study, a comprehensive tehsil-wise list of farmers registered in KVK for Cluster Front Line Demonstration (CFLD) of groundnut in Bikaner, Rajasthan, was obtained. The proportionate random sampling method was employed to choose respondents. Those with registration and training in KVK for CFLD of groundnut were classified as beneficiary farmers. To constitute the other half of the sample, an equal number of farmers were randomly selected from the same tehsils who had not registered in KVK for CFLD but had been consistently cultivating groundnut for the past five years, and they were categorized as non-beneficiary respondents. Consequently, a total sample of 160 respondents was established, comprising 80 beneficiary and 80 non-beneficiary farmers for the current investigation.

Table 1: Tehsil-wise selection of respondents.

Sr. No.	*Tehsils*	No. of Total Beneficiary Farmers	No. of Selected Beneficiary Farmers	No. of Selected Non-Beneficiary Farmers
1.	Bikaner	148	44	44
2.	Kolayat	123	36	36
	Total	271	80	80

(Source: - KVK, Bikaner, 2016-20)

Constraints. Constraints imply forcible restriction and confinement of action. In this study, Constraints mean "Difficulties" as perceived by the respondents in the adoption of CFLD on groundnut. To measure the constraints responsible for hindering the adoption of CFLD on groundnut by respondents, a suitable structured schedule was developed. It was studied under various components viz. input, financial, technical, environmental and marketing Constraints. The respondents were asked to give the response on two-point continuum as ‘yes’ for facing Constraints and ‘no’ for not facing any Constraints. The scores were assigned accordingly as 1 and 0, respectively for each item. After that on the basis of scores in each category

of problem, mean percent score was calculated for each dimension. Ranking for each item under its main component has been done.

Statistical Tools Used for Analysis of Data

Mean Per cent Score (MPS). It was computed by multiplying total obtained score of the respondents by 100 and dividing by the maximum obtainable score under each practice.

$$MPS = \frac{\text{Total score obtained by the respondents}}{\text{Maximum obtainable score}} \times 100$$

't' Test (Student 't' test). This test was used to observe significant difference between two sample mean for small sample. The formula of 't' test as under

$$t = \frac{|\bar{X} - \bar{Y}|}{Sp\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad Sp = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Where,

$\bar{X}$ = mean of the group of beneficiary respondents

$\bar{Y}$ = mean of the group of non – beneficiary respondents

S_1 = Standard deviation of first sample

S_2 = standard deviation of second sample

n_1 = size of first sample

n_2 = size of second sample

d.f. = $n_1 + n_2 - 2$

Spearman's Rank Correlation (r_s)

This test was applied to determine the relationship between the ranks assigned by the two categories of respondents

$$r_s = 1 - \frac{6\Sigma di^2}{n(n^2 - 1)}$$

Where,

di = different of rank of the beneficiary and non-beneficiary respondents

n = number of items/observations

For repeated value of items, the formula of r_s was used as given under

$$r_s = 1 - \frac{[6(\Sigma di^2) + 1/12(t^2 - t) + 1/12(t^3 - t)]}{n(n^2 - 1)}$$

t = Number of item value was repeated, thus if measurement 'x' is repeated two items then the value of 't' will be 2. If repeated three times then the value of 't' will be 3. The significance of correlation coefficient was tested by using following formula

$$t = r\frac{\sqrt{n-2}}{\sqrt{(1 - r^2)}}$$

The value of 'r' always lies between -1 to +1. Positive value of 'r' indicates attendance of 'x' and 'y' to increase together where 'y' for the test of significance 'r' tabulated is located at (n-2) degree of freedom.

RESULTS AND DISCUSSION

Constraints being faced by CFLD farmers in adoption of groundnut production technologies. In this section, it was tried to find out the Constraints being faced by the respondents in the adoption of groundnut production technology under CFLD. For the present investigation, all the possible Constraints being faced by the beneficiary and non-beneficiary farmers were grouped into five major categories viz. input, financial, technical, environmental and marketing Constraints. In order to study the various types of Constraints, the respondents were asked to give the response on two point continuum. After that on the basis of scores obtained in each category of Constraints mean per cent score (MPS) was calculated for each dimension.

Input Constraints. The data in Table 2 reveals that input Constraints *viz.*, 'unavailability of improved seeds at the time of sowing' which was ranked first by the beneficiary (62.50 MPS) respondents followed by 'unavailability of fertilizer at the time of sowing' (56.25 MPS), 'more requirement of fertilizers and manures for groundnut' (51.25 MPS), 'unavailability of bio-fertilizer/culture at the time of sowing'(45.00 MPS) and 'unavailability of recommended chemicals for plant protection measures' (20.00 MPS) ranked second, third, fourth and fifth, respectively.

Whereas, in case of non-beneficiary farmers the first rank was assigned for 'Unavailability of fertilizers at the time of sowing' (81.25 MPS) followed by 'Unavailability of improved seed at the time of sowing' (78.75 MPS), 'Unavailability of recommended chemicals for plant protection measures' (67.50 MPS), 'More requirement of fertilizers and manures for groundnut' (65.00 MPS) and 'Unavailability of bio-fertilizer / culture at time of sowing' (58.75 MPS) were ranked second, third, fourth, and fifth, respectively.

For overall respondents 'Unavailability of improved seed at the time of sowing' got first rank with 70.62 MPS followed by 'Unavailability of fertilizers at the time of sowing' (68.75 MPS), 'More requirement of fertilizers and manures for groundnut' (58.12 MPS), 'Unavailability of bio-fertilizer / culture at time of sowing' (51.87 MPS), 'Unavailability of recommended chemicals for plant protection measures' (43.75 MPS) were ranked second, third, fourth and fifth, respectively. The value of calculated rank correlation (r_s) was 0.60 which was non-significant, leading to conclusion that there was a similarity in rank assignment pattern of input Constraints of beneficiary and non-beneficiary farmers about groundnut production technology under CFLD. Though there was a difference in the magnitude of MPS of beneficiary and non-beneficiary farmers.

The present findings are in line with the findings of Bagenia and Lakhera (2017); Deshmukh *et al.* (2018) who concluded that the major Constraints faced by the mustard growing farmers are inadequate supply of improved seeds and fertilizer at time of sowing.

Financial Constraints. The data in Table 3 depicts that major Constraints faced by beneficiary farmers were 'High cost of improved seeds' (57.50 MPS) which was ranked first followed by 'High cost of fertilizers' (53.75 MPS) 'High cost of plant protection chemicals' (45.00 MPS) 'Unavailability of procurement prices of the product' (26.25 MPS) 'High cost of labour' (21.25 MPS) 'Unavailability of credit on low interest rate' (18.75 MPS) were ranked second, third, fourth, fifth and sixth, respectively.

Table 2: Ranking of Items under Input Constraints.

Sr. No.	Input Constraints	Respondents					
		Beneficiary Respondents (n=80)		Non-beneficiary Respondents (n=80)		Overall Respondents (N =160)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Unavailability of improved seed at the time of sowing	62.50	I	78.75	II	70.62	I
2.	Unavailability of fertilizers at the time of sowing	56.25	II	81.25	I	68.75	II
3.	More requirement of fertilizers and manures for groundnut	51.25	III	65.00	IV	58.12	III
4.	Unavailability of bio-fertilizer / culture at time of sowing	45.00	IV	58.75	V	51.87	IV
5.	Unavailability of recommended chemicals for plant protection measures	20.00	V	67.50	III	43.75	V
	Pooled	47.00		70.25		58.62	

r_s= rank correlation $r_s = 0.60$
MPS= Mean Percent Score $t = 1.29^{NS}$
NS = Non-Significant

Further, examination of the Table 3 reveals that the major constraints perceived by the non-beneficiary respondents were 'High cost of fertilizers' (82.50 MPS) which was ranked first followed by **'**High cost of improved seeds' (80.00 MPS) 'Unavailability of credit on low interest rate' (61.25 MPS) 'High cost of plant protection chemicals' (60.00 MPS) 'Unavailability of procurement prices of the product' (41.25 MPS) 'High cost of labour' (37.50 MPS) were ranked second, third, fourth, fifth and sixth, respectively.

If we look at the data in Table 3 irrespective of beneficiary and non-beneficiary respondents, data reveals that major constraints perceived by the overall respondents were **'**High cost of improved seeds' (68.75 MPS) which was ranked first followed by 'High cost of fertilizers' (68.12 MPS) 'High cost of plant protection chemicals' (52.50 MPS) 'Unavailability of credit on low interest rate' (40.00 MPS) and 'Unavailability of procurement prices of the product' (33.75 MPS) were ranked second, third, fourth and fifth respectively. While 'High cost of labour' (29.37 MPS) were faced least by overall respondents as serious problem so ranked as sixth. Here, the value of calculated rank correlation (r_s) was 0.60 which was non-significant, leading to conclusion that there was a similarity in rank assignment pattern of financial Constraints of beneficiary and non-beneficiary respondents about groundnut production technology under CFLD, though there was a difference in the magnitude of MPS of beneficiary and non-beneficiary farmers. The findings are in accordance with the findings of Khatik (2017); Gamit *et al.* (2017) who reported the major Constraints faced by the farmers are lack of finance to purchase the inputs, high cost of plant protection materials and improved seeds.

Table 3: Ranking of Items under Financial Constraints.

Sr. No.	Financial Constraints	Respondents					
		Beneficiary Respondents (n= 80)		Non-beneficiary Respondents (n= 80)		Overall Respondents (N= 160)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	High cost of improved seeds	57.50	I	80.00	II	68.75	I
2.	High cost of fertilizers	53.75	II	82.50	I	68.12	II
3.	High cost of plant protection chemicals	45.00	III	60.00	IV	52.50	III
4.	High cost of labour	21.25	V	37.50	VI	29.37	VI
5.	Unavailability of credit on low interest rate	18.75	VI	61.25	III	40.00	IV
6.	Unavailability of procurement prices of the product	26.25	IV	41.25	V	33.75	V
	Pooled	37.08		60.41		48.75	

r_s= rank correlation r_s= 0.60
MPS= Mean Percent Score $t = 1.50^{NS}$

Technical Constraints. The data in Table 4 depicts that major Constraints faced by beneficiary farmers were 'unavailability of technical advice as and when needed' (65.00 MPS) which was ranked first followed by 'weed control through herbicides are technically complicated practice' (62.50 MPS), 'lack of knowledge about recommended dose of fertilizers used/ha' (46.25 MPS), 'lack of knowledge about weed control'(42.50 MPS), 'lack of skill for seed treatment'(33.75 MPS), 'lack of knowledge about recommended plant protection measures' (31.25 MPS) and 'lack of knowledge about recommended seed rate'(25.00 MPS) ranked second, third, fourth, fifth, sixth and seventh respectively and 'lack of knowledge about critical

stages of irrigation'(15.00 MPS) was ranked eighth and last.

Further, examination of the Table 4 reveals that the major Constraints perceived by the non-beneficiary respondents were 'lack of knowledge about weed control'(87.50 MPS), which was ranked first followed by 'unavailability of technical advice as and when needed' (83.75 MPS) 'weed control through herbicides are technically complicated practice' (80.00 MPS), 'lack of knowledge about recommended dose of fertilizers used/ha' (57.50 MPS), 'lack of skill for seed treatment'(51.25 MPS), 'lack of knowledge about recommended plant protection measures'(43.75 MPS) and 'lack of knowledge about critical stages of irrigation'(40.00 MPS) ranked second, third, fourth, fifth, sixth and seventh, respectively and 'lack of knowledge about recommended seed rate'(32.50 MPS) was ranked eighth and last.

If we look at the data in Table 4 irrespective of beneficiary and non-beneficiary respondents, data reveals that major Constraints perceived by the overall respondents were 'unavailability of technical advice as and when needed' (74.37 MPS) which was ranked first followed by 'weed control through herbicides are technically complicated practice' (71.25 MPS), 'lack of knowledge about weed control'(65.00 MPS), 'lack of knowledge about recommended dose of fertilizers used/ha' (51.87 MPS), 'lack of skill for seed treatment' (42.50 MPS), 'lack of knowledge about recommended plant protection measures'(37.50 MPS) and 'lack of knowledge about recommended seed rate'(28.75 MPS) ranked second, third and fourth, fifth, sixth and seventh respectively and 'lack of knowledge about critical stages of irrigation'(27.50 MPS) was ranked eighth and last.

Table 4: Ranking of Items under Technical Constraints.

Sr. No.	Technical Constraints	Respondents					
		Beneficiary Respondents (n= 80)		Non-beneficiary Respondents (n= 80)		Overall Respondents (N= 160)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Lack of skill for seed treatment	33.75	V	51.25	V	42.50	V
2.	Lack of knowledge about weed control	42.50	IV	87.50	I	65.00	III
3.	Weed control through herbicides are technically complicated practice	62.50	II	80.00	III	71.25	II
4.	Unavailability of technical advice as and when needed	65.00	I	83.75	II	74.37	I
5.	Lack of knowledge about recommended seed rate	25.00	VII	32.50	VIII	28.75	VII
6.	Lack of knowledge about recommended dose of fertilizers used/ha	46.25	III	57.50	IV	51.87	IV
7.	Lack of knowledge about recommended plant protection measures	31.25	VI	43.75	VI	37.50	VI
8.	Lack of knowledge about critical stages of irrigation	15.00	VIII	40.00	VII	27.50	VIII
	Pooled	40.15		59.53		49.84	

r_s= rank correlation r_s= 0.83
MPS= Mean Percent Score t = 3.64**
**Significant at 0.01 level of probability

The value of calculated rank correlation (r_s) was 0.83 which was positive and significant at one per cent level of significance, leading to conclusion that there was a similarity in rank assignment pattern of technical Constraints of beneficiary and non-beneficiary farmers about groundnut production technologies under CFLD, although there was a difference in the values of MPS of beneficiary and non-beneficiary respondents. Thus, from the above findings it may be concluded that majority of the respondents reported that unavailability of technical advice as and when needed and weed control through herbicides are technically complicated practice because were the major Constraints. The findings are in line with the findings of Markana *et al.* (2015) who stated that the difficulties faced by the groundnut growers were more incidence of insects, pests and diseases, lack of knowledge regarding recommended doses of insecticides/pesticides, lack of knowledge about proper diagnosis of diseases/pests, lack of knowledge regarding seed treatment and lack of effective bio-pesticides. The findings are also supported by Patel *et al.* (2016) who found major constraints faced by the groundnut growers was lack of timely and appropriate extension services. In a similar investigation, the primary barriers to the adoption of High-Yielding Varieties (HYVs) of groundnut were identified as insufficient awareness about appropriate HYVs, limited understanding of soil fertility, and low levels of technological knowledge among farmers. The analysis of the impact of Front line demonstrations revealed that increased knowledge and enhanced satisfaction among farmers were the key drivers behind the widespread adoption of these practices (Rai *et al.*, 2020). Increased technological awareness through frontline demonstration minimizes the yield gap, increases the productivity of groundnut crop as reported

in the earlier research of Ali *et al.* (2022); Marlabeedu *et al.* (2022). In a similar study, Dash *et al.* (2021) reported a 32.9% increase in the average groundnut yield through demonstration practices compared to farmers' conventional methods. Similar findings were also reported in the earlier study of Saravanakumar *et al.* (2020).

Environmental Constraints. The data in Table 5 reveals that major constraints perceived by the beneficiary respondents under environmental Constraints were 'erratic rainfall' (86.25 MPS) ranked first followed by 'insect-pests & diseases infestation due to continuous rainfall' (78.75 MPS), 'long dry spell' (77.50 MPS), 'higher susceptibility to insect-pests & diseases' (72.50 MPS), 'high temperature' (71.25 MPS) and 'cloudy weather at the time of flowering' (65.00 MPS) were ranked second, third and fourth, fifth and sixth respectively.

Table 5: Ranking of Items under Environmental Constraints.

Sr. No.	Environmental Constraints	Respondents					
		Beneficiary Respondents (n= 80)		Non-beneficiary Respondents (n= 80)		Overall Respondents (N= 160)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Erratic rainfall	86.25	I	96.25	I	91.25	I
2.	High temperature	71.25	V	88.75	IV	80.00	IV
3.	Long dry spell	77.50	III	92.50	II	85.00	II
4.	Cloudy weather at the time of flowering	65.00	VI	85.00	V	75.00	VI
5.	Insect-pests & diseases infestation due to continuous rainfall	78.75	II	90.00	III	84.37	III
6.	Higher susceptibility to insect-pests & diseases	72.50	IV	78.75	VI	75.62	V
	Pooled	75.20		88.54		81.87	

r_s= rank correlation $r_s = 0.77$
MPS= Mean Percent Score t =2.41*
Significant at 0.05 level of probability

The data in Table 5 also presents that major constraints perceived by the non-beneficiary respondents were 'erratic rainfall' (96.25 MPS) ranked first followed by 'long dry spell' (92.50 MPS), 'insect-pests & diseases infestation due to continuous rainfall' (90.00 MPS), 'high temperature' (88.75 MPS) 'cloudy weather at the time of flowering' (85.00 MPS) and 'higher susceptibility to insect-pests & diseases' (78.75 MPS) were ranked second, third and fourth, fifth and sixth, respectively.

Further, Table 5 also depicts that major constraints faced by overall respondents were ''erratic rainfall' (91.25 MPS) ranked first followed by 'long dry spell' (85.00 MPS), 'insect-pests & diseases infestation due to continuous rainfall' (84.37 MPS), 'high temperature' (80.00 MPS), 'higher susceptibility to insect-pests & diseases' (75.62 MPS) and 'cloudy weather at the time of flowering' (75.00 MPS) were ranked second, third and fourth, fifth and sixth respectively.

Here, the value of calculated rank correlation (r_s) was 0.77 which was positive and significant at five per cent level of significance, leading to conclusion that there was a similarity in rank assignment pattern of environmental Constraints of beneficiary and non-beneficiary farmers about groundnut production technologies under CFLD, though there was a difference in the magnitude of MPS of beneficiary and non-beneficiary farmers. The findings of the study are supported by the findings of Daudi *et al*. (2018) who concluded that the major Constraints faced by the farmers are high infestation of diseases and pests and drought stress in groundnut cultivation. The findings also supported by Bhanarkar (2019) who stated late sowing due to unfavorable agro - climatic condition was also reported by linseed growers.

Marketing Constraints. The data in Table 6 reveals that major Constraints perceived by the beneficiary respondents were 'Constraints of marketing in remote areas' (85.00 MPS) ranked first followed by 'lower price at the time of harvesting' (77.50 MPS) second, 'poor farmer's cooperative structures' (57.50 MPS) ranked third and 'lack of storage facility' (62.96 MPS) ranked fourth, 'absence of assured marketing at remunerative price & insurance facility' (37.50 MPS) ranked fifth, 'lack of government grain procurement agencies' (35.00 MPS) ranked sixth and 'lack of transport facility' (26.25 MPS) ranked seventh.

The data in Table 6 also indicates that major marketing Constraints perceived by the non-beneficiary respondents were 'lower price at the time of harvesting' (97.50 MPS) ranked first followed by 'Constraints of marketing in remote areas' (96.25 MPS) second, 'lack of storage facility' (77.50 MPS) ranked third 'Poor farmer's cooperative structures' (72.50 MPS) ranked fourth, 'lack of government grain procurement agencies' (56.25 MPS) ranked fifth, 'lack of transport facility' (52.50 MPS) ranked sixth and 'absence of assured marketing at remunerative price & insurance facility' (50.00 MPS) ranked seventh.

Table 6: Ranking of Items under Marketing Constraints.

Sr. No.	Marketing Constraints	Respondents					
		Beneficiary Respondents (n= 80)		Non-beneficiary Respondents (n= 80)		Overall Respondents (N= 160)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Lack of storage facility	53.75	IV	77.50	III	65.62	III
2.	Lack of transport facility	26.25	VII	52.50	VI	39.37	VII
3.	Lack of government grain procurement agencies	35.00	VI	56.25	V	45.62	V
4.	Poor farmer's cooperative structures	57.50	III	72.50	IV	65.00	IV
5.	Constraints of marketing in remote areas	85.00	I	96.25	II	90.62	I
6.	Lower price at the time of harvesting	77.50	II	97.50	I	87.50	II
7.	Absence of assured marketing at remunerative price & insurance facility	37.50	V	50.00	VII	43.75	VI
	Pooled	53.21		71.78		62.49	

r_s= rank correlation $r_s = 0.82$

MPS= Mean Percent Score t = 3.20**

Significant at 0.01 level of probability

Further, Table 6 also depicts that major constraints faced by overall respondents were 'Constraints of marketing in remote areas' (90.62 MPS) ranked first followed by 'lower price at the time of harvesting' (87.50 MPS) second, 'lack of storage facility' (65.62 MPS) ranked third 'Poor farmer's cooperative structures' (65.00 MPS) ranked fourth, 'lack of government grain procurement agencies' (45.62 MPS) ranked fifth, 'absence of assured marketing at remunerative price & insurance facility' (43.75 MPS) ranked sixth and 'lack of transport facility' (39.37 MPS) ranked seventh was perceived least important by the overall respondents in the study area as they had assigned last rank. Here, the value of calculated rank correlation (r_s) was 0.82 which was positive and significant at one per cent level of significance, leading to conclusion that there was a similarity in rank assignment pattern of financial constraints of beneficiary and non-beneficiary farmers about groundnut production technologies under CFLD, though there was a difference in the magnitude of MPS of beneficiary and non-beneficiary farmers. The findings are supported by the findings of Patel *et al*. (2016); Khatik (2017) who concluded that the major Constraints faced by the farmers are lack of marketing facility and lack of storage facility which leads to low selling price at time of harvesting. These constraints included inadequate financing, difficulties in obtaining a remunerative price for their products in the local market, labour shortages and high wages, as well as a lack of training on improved production technologies.

CONCLUSIONS

- Out of five input Constraints 'Unavailability of improved seed at the time of sowing' got first rank with 70.62 MPS followed by 'Unavailability of fertilizers at the time of sowing' (68.75 MPS), second and 'More requirement of fertilizers and manures for groundnut' (58.12 MPS) given third rank by overall respondents.
- Out of six financial Constraints 'High cost of improved seeds' (68.75MPS) which was ranked first followed by 'High cost of fertilizers' (68.12 MPS), 'High cost of plant protection chemicals' (52.50 MPS) ranked second and third, respectively.
- In eight technical Constraints 'unavailability of technical advice as and when needed' (74.37 MPS) ranked first followed by 'weed control through herbicides are technically complicated practice' (71.25 MPS) and 'lack of knowledge about weed control' (65.00 MPS) was ranked second and third, respectively.
- The rank order of environmental Constraints was ''erratic rainfall' (91.25 MPS) ranked as first followed by 'long dry spell' (85.00 MPS) as second and 'insect-pests & diseases infestation due to continuous rainfall' (84.37 MPS) as third for overall respondents of CFLD.
- Under the seven marketing Constraints 'Constraints of marketing in remote areas' (90.62 MPS) ranked first followed by 'lower price at the time of harvesting' (87.50 MPS) second and 'lack of storage facility' (65.62 MPS) ranked third by the overall respondents.

The most important Constraints faced by the respondents in the adoption of groundnut production technologies demonstrated CFLD were "unavailability of improved seed at the time of sowing", "high cost of improved seeds", "unavailability of technical advice as and when needed", "erratic rainfall" and "Constraints of marketing in remote areas".

Hence, it can be said that farmers in the study area required more exposure to groundnut production technologies through awareness programmes like village level campaigns, kisan goshthies, educational tours, organisation of farmer's fair etc. Trainings about improved farming practices of groundnut be organized at village level as per the needs of farmers. The farmers in vicinity of demonstration field and nearby villages should be invited at the time of field day so that they can interact with the scientists of the KVK and demonstration farmer and be motivated to adopt the improved technologies of groundnut production. Special sessions of progressive farmers should be organized at village, tehsil and district level to motivate the fellow farmers to enhance the adoption of groundnut production technologies. The period of demonstration programme should be increased so that adoption of groundnut production technologies could be

enhanced. It is also to be ensured that farmers get solutions of Constraints as soon as possible as it motivates the farmers to adopt new and improved technologies for groundnut cultivation.

FUTURE SCOPE

To mitigate these Constraints farmers may be made aware about the post harvesting practices and technology, contact to extension experts and trainings about production technologies by State Government through awareness camps. Government should also take the necessary step to ensure the availability of technical advice as and when needed.

The findings of this study were derived from the verbal responses of the participants; however, to enhance result accuracy, a participatory investigation could be carried out. An in-depth examination of problem analysis related to the non-adoption and partial adoption of Cluster Front Line Demonstration (CFLD) by farmers could be undertaken. Additionally, a thorough investigation into the effects of Cluster Front Line Demonstration on the personal, social, and economic circumstances of farmers could be conducted for a comprehensive study.

Acknowledgement. I am highly obliged and grateful to Dr. I.P. Singh, Dean, College of Agriculture, SKRAU, Bikaner, and Research guide Dr. R.K. Verma, Professor & Head, Department of Agricultural Extension and Communication, College of Agriculture, SKRAU, Bikaner for their engrossing guidance, constructive suggestions, incessant encouragement and cooperation during the entire course of investigation and preparation of this manuscript.

Conflict of Interest. None.

REFERENCES

Ali, S., Singh, B., Meena, R., Kendra, K. V. and Padampur, S. R. I. (2022). Technology gap assessment and productivity gain through front line demonstration in groundnut. *International Journal of Agricultural Sciences*, *18*(1), 396-401.

Anonymous (2020a). Directorate of Economics & Statistics, Government of India, https://www.agricoop.nic.in

Bagenia, P. S. and Lakhera, J. P. (2017). Adoption behaviour of small farmers about mustard production technology in Bharatpur district of Rajasthan. *Agriculture Update*, *12*(1), 89-94.

Bezbaruah, R. and Deka, R. S. (2020). Impact of cluster frontline demonstration on productivity and profitability of greengram in Morigaon district of Assam. *Journal of Krishi Vigyan*, *9*(1), 164-169.

Bhanarkar, M. G. (2019) Impact of linseed demonstrations on the beneficiary farmers in Nagpur district of Vidarbha region. M.Sc. Thesis (Unpub.) Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.)

Dash, S. R., Behera, N., Das, H., Kumar, R. A., Rautaray, B. K. and Bar, N. (2021). Yield Gap Analysis for Groundnut through Cluster Front Line Demonstration in South Eastern Ghat Zone of Odisha. *International Journal of Agriculture, Environment and Biotechnology, 14*(2), 1-4.

Daudi, H., Shimelis, H., Laing, M., Okori, P. and Mponda, O. (2018). Groundnut production constraints, farming systems, and farmer-preferred traits in Tanzania, *Journal of Crop Improvement*, *32*(6), 812-828.

Deshmukh, S. K., Tekale, V. S., Bhople, P. P. and Rathod, M. K. (2018). Impact of front line demonstration of soybean conducted by KVK in Washim Districts, RRC project. Dr. PDKV, Akola.

Gamit, P. S., Khodifad, P. B. and Dedun, V. S. (2017). Constraints Faced by frontline demonstration beneficiary's neighbouring farmers. *Guj. J. Ext. Edu. Special Issue on National Seminar*.

Ghosh, B., Das, S., Ghosh, S. and Pal, P. P. (2023). Appraisal of cluster frontline demonstration on groundnut (*Arachis hypogaea*) in West Bengal and Odisha. *Journal of Community Mobilization and Sustainable Development*, *18*(2), 415-425.

Khatik, A. (2017). A study on differential impact of frontline demonstration on scientific temperament of soybean growers in Shivpuri district of M.P., M.Sc. Thesis (Unpub.) Rajmata Vijayraje Scindia Krishi Vishwavidyalaya, Gwalior.

Markana, J. G., Kalsariya, B. N. and Bharad, N. D. (2015). Constraints faced by farmers in adoption of scientific kharif groundnut production technologies. *Gujarat Journal of Extension Education*, *26*(1), 43-46.

Marlabeedu, S., Bharath, T., Pallavi, S., Himabindu, T., Shankaraiah, M. and Sumalini, K. (2022). Impact Analysis of Cluster Frontline Demonstrations on Groundnut in Nalgonda District, Telangana. *Indian Journal of Extension Education*, *58*(4), 66-70.

Patel, J. A., Desai, H. K., Prajapati, M. M. and Patel, V. T. (2016). Extent of adoption of kharif Groundnut production technology. *International Journal of Agriculture Sciences*, *8*(36), 1748-1751.

Rai, A. K., Khajuria, S. and Lata, K. (2020). Impact of front line demonstrations in transfer of groundnut production technology in semi arid region. *Gujarat Journal of Extension Education*, *31*(1), 6-10.

Rao, N. G. (1991). Statistics for Agricultural Sciences. Oxford & IBH Publishing Co., Bombay.

Saravanakumar, S., Premalatha, A., Prabakaran, D. J. and Thirumoorthi, M. (2020). Evaluation of Cluster Frontline Demonstration on Urd for Enhancing Productivity. *Indian Journal of Extension Education*, *56*(3), 101-103.

How to cite this article: Sanskaran Swami, Rajesh Kumar Verma, Sanju Meena, Vijender Kumar, Priyanka Yadav and Shobhana Bishnoi (2023). Exploring Constraints in the Adoption of Groundnut Production Technologies by CFLD Farmers: A Comprehensive Study. *Biological Forum – An International Journal*, *15*(10): 39-46.