

Original Research Article

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## Impact of Cluster Front Line Demonstrations (CFLDS) on Toria (*Brassica campestris* L.) in Lakhimpur District of Assam, India

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### ABSTRACT

Two hundred thirty two Cluster Front Line Demonstrations on toria were conducted at six different blocks of Lakhimpur district of Assam during 2015-16 to 2018-19. The average yield of toria varieties under demonstration was 982 kg/ha as compared to 641 kg/ha in farmers practice. The highest yield of toria was recorded in Telahi (1055 kg/ha) block followed by Lakhimpur block (992 kg/ha). Among the blocks, the yield gap was higher in Telahi block followed by Lakhimpur ranging from 301 to 420 kg/ha. There is urgent need to make stronger extension services for educating the farmers in the implementation of improved technology. The technology gap of 145 to 252 kg/ha was recorded with the technology index of 12.08 to 21.0 per cent which indicated the need to educate farmers and lower the technology index showed the feasibility of demonstrated improved technology at location specific farmers' field. The net return (Rs 19,490/ha), additional return (Rs. 12,560/ha), benefit cost ratio (2.37) and incremental benefit cost ratio (14.27) were found higher under improved technology demonstrated at Telahi block as compared to farmers practice.

#### Keywords

Toria, Cluster front line demonstration, Extension gap, Technology gap, Technology index

#### Article Info

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### Introduction

Oil seeds are rich source of fat and edible oils have various uses for human being and animals. About 90 per cent of the total edible oil produced in the country comes from two oil seed crops namely rapeseed-mustard and groundnut. The oil cakes are also used as

cattle feed and manures. In India, rape seed mustard is an important source of edible oil followed by ground nut (Panday *et al.*, 1999). Among the oilseeds grown in India, toria accounts for 22.4% and 22.6% of acreage and production respectively during 2011-12. India holds a premier position in toria economy of the world with about 20.2% acreage and

10.7% production during 2011-12. They occupied an area of about 5.9 million ha with about 6.78 million tonnes production and with an average yield of 1145 kg/ha during 2011-12. In Assam, the total cultivated area under toria, total production and average productivity are 2,81,006 ha, 1,87,522 tonnes, and 667 kg/ha, respectively. In Lakhimpur district the total area under toria is 21,700 ha and the production is 13,888 tonnes with the average productivity of about 640 kg/ha. Keeping in view the low productivity of toria, the present study was undertaken to study the impact of Cluster Front Line Demonstration (CFLD) on toria in six different blocks of Lakhimpur district of Assam. The Cluster Front Line Demonstration (CFLD) is an applied approach to accelerate the dissemination of proven technologies at farmer's fields in a participatory mode with an objective to explore the maximum available resources of crop production and also to bridge the productivity gaps by enhancing the production in national basket.

### **Materials and Methods**

Two hundred thirty two numbers of Cluster Front Line Demonstrations (CFLDs) on toria were conducted during 2015-16 to 2018-19 at six different blocks viz., Lakhimpur, Dhakuakhana, Ghilamora, Telahi, Karunabari and Narayanpur of Lakhimpur district of Assam (Table 1). For conducting the demonstrations, farmers were identified/selected following the survey suggested by Choudhary (1999). The required inputs were supplied and regular visits to the demonstration fields by the KVK scientists ensured proper guidance to the farmers.

Trainings, Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The sowing was done during mid October to first week of December under rainfed conditions and harvested during mid January to first week of March depending upon the variety. The recommended varieties of TS-38 and TS-67 were demonstrated by using the seed rate of 10 kg/ha. Seed treatment was done with bio-fertilizer (Azotobacter and PSB@ 50g/kg seed), Vermicompost @ 2.5q/ha and Borax @ 10 kg/ha were also applied in demonstration along with 50% recommended dose of N, P and full dose of K fertilizer. However, the practices followed by farmers in general use local variety mainly M-27 with the seed rate ranged from 15-20 kg/ha, no seed treatment, sowing from last week of October to last week of November, in broadcasting manner. Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The yield data for demonstrated improved technology (IT) and farmers' practice (FP) were collected from the equal areas. The demonstration was conducted to study the gaps between the potential yield and demonstration yield, extension gap and technology index. In the present evaluation study, the data on output of toria cultivation were collected from demonstrated plots, besides the data on local practices commonly adopted by the farmers of the district were also collected.

To estimate the technology gap, extension gap and technology index, the formulae (*Samui et. al.*, 2000) has been depicted as:

$$\text{Technology gap} = \text{Potential yield} - \text{Demonstration yield}$$

$$\text{Extension gap} = \text{Demonstration yield} - \text{Farmers yield}$$

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

$$\text{Additional return} = \text{Demonstration return} - \text{Farmers practice return}$$

$$\text{Incremental B: C ratio} = \frac{\text{Additional return}}{\text{Additional cost}}$$

To estimate the impact in terms of monetary benefits, the benefit cost ratio (BCR) analysis of improved technology (IT) over the real farmers' practices (FP) was worked out with the prevailing market value of the crop.

## Results and Discussion

### Yield gaps

The data presented in Table-2 indicated that the average seed yield of toria varieties under demonstration was 982 kg/ha as compared to 641 kg/ha in farmers practice. This indicated that the use of improved varieties along with improved technology contributed 53.20 per cent higher production than farmers' traditional varieties. The highest yield of toria was recorded in Telahi (1055kg/ha) block followed by Lakhimpur block (992 kg/ha). The lowest demonstrated toria yield of 948 kg/ha was recorded in Dhakuakhana development block.

The technology gap which corroborates to the gap in demonstration yield over potential yield ranged from 145 kg/ha at Telahi block to 252 kg/ha at Dhakuakhana block. The technology gap observed may be attributed to dissimilarity in soil fertility status, topography, sowing time and weather conditions at different blocks in the district. Hence, location specific recommendations appear to be necessary to bridge the gap between the yields of toria. The highest extension gap was found at Telahi block

followed by Lakhimpur block which emphasized the need to educate the farmers' to adopt improved agro-technologies to reverse the trend of wide extension gap. More and more use of HYVs by the farmers may subsequently change this alarming trend of galloping extension gaps (*Sarma et al.*, 2014). The new technologies will eventually lead to the farmers to disenchantment discontinuance of old varieties with new technology. The technology index showed the feasibility of evolved technologies at farmer's field. The lowest technology index of 12.08 per cent at Telahi block and highest technology index of 21.0 per cent at Dhakuakhana block which indicated that lower the value of technology index, more is the feasibility of the technology demonstrated (Table-2).

### Economic analysis

The gross return (Rs. 33,760/ha), net return (Rs.19,490/ha), additional return (Rs. 12,560/ha), benefit cost ratio (2.37) and incremental benefit cost ratio (14.27) were found higher under improved technology demonstrated at Telahi block followed by Lakhimpur block as compared to farmers practice (Table-3). Hence, higher benefit cost ratio proved economic viability of the improved technology (IT) demonstrated at different blocks in Lakhimpur district of Assam. This finding is in conformity with the finding of *Balai et al.*, 2012 in rapeseed and mustard and *Sharma*, 2003 in moth bean.

**Table.1** Number of Cluster Frontline Demonstrations (CFLDs) on toria conducted in different blocks of Lakhimpur district of Assam (2015-16 to 2018-19)

Blocks	Demonstration conducted				Total
	2015-16	2016-17	2017-18	2018-19	
Lakhimpur	4	15	8	3	30
Dhakuakhana		7	88		95
Ghilamora		5	2	8	15
Telahi	1		7		8
Karunabari			5	64	69
Narayanpur			15		15
<b>Total</b>	<b>05</b>	<b>27</b>	<b>125</b>	<b>75</b>	<b>232</b>

**Table.2** Yield gaps analysis of Cluster Frontline Demonstrations (CFLDs) on toria in different blocks of Lakhimpur district of Assam (2015-16 to 2018-19). (4 years pooled)

Blocks	Yield (kg/ha)			% increase	Technology gap (kg/ha)	Extension gap (kg/ha)	Technology index (%)
	Potential	IT	FP				
Lakhimpur	1200	992	639	55.24	208	353	17.33
Dhakuakhana	1200	948	647	46.52	252	301	21.00
Ghilamora	1200	968	657	47.34	232	311	19.33
Telahi	1200	1055	635	66.14	145	420	12.08
Karunabari	1200	951	643	47.90	249	308	20.75
Narayanpur	1200	979	630	55.40	221	349	18.42
<b>Pooled</b>	<b>1200</b>	<b>982</b>	<b>641</b>	<b>53.20</b>	<b>218</b>	<b>341</b>	<b>18.17</b>

**Table.3** Economic impact of improved technology (IT) on toria over farmers practice (FP) in Lakhimpur, Assam (4 years pooled)

Blocks	Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net return (Rs./ha)		BCR		Additional Return (Rs/ha)	IBCR
	IT	FP	IT	FP	IT	FP	IT	FP		
Lakhimpur	14510	13580	33728	21726	19218	8146	2.32	1.60	11072	11.91
Dhakuakhana	14880	13810	31284	21351	16404	7541	2.10	1.55	8863	8.28
Ghilamora	13920	12820	31944	21681	18024	8861	2.29	1.69	9163	8.33
Telahi	14270	13390	33760	20320	19490	6930	2.37	1.52	12560	14.27
Karunabari	14840	13760	32334	21862	17494	8102	2.18	1.59	9392	8.70
Narayanpur	14920	13830	31328	20160	16408	6330	2.10	1.46	10078	9.25
<b>Pooled</b>	<b>14557</b>	<b>13531</b>	<b>32396</b>	<b>21183</b>	<b>17839</b>	<b>7652</b>	<b>2.23</b>	<b>1.57</b>	<b>10188</b>	<b>10.12</b>

In conclusion, the technologies demonstrated under Cluster Line Demonstrations had been exploited to obtain the maximum yield, net profit and additional income of toria cultivation which lead to economic viability of the farming in the district. The yield and profit gaps between technology demonstrated and farmers practice might be due to biophysical, socio-economic, management, institutional, and policy factors. The highest extension gap reflects the need to educate the farmers through various means for adoption of improved technologies to reverse the trend of wide extension gap.

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